EVALUATION OF APPROPRIATE MEDICATION USE IN THE ELDERLY AT THE EMERGENCY DEPARTMENT

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Background:
The Beers criteria is a consensus-based list of medications identified as potentially inappropriate for use in older adults. Beers criteria medications were updated in 2003 to apply to all individuals aged 65 years and older, regardless of level of frailty or place of residence. Medications on this list are judged to be ineffective and/or may pose unnecessary risk to patients. Medication effects are different among various age groups because of both normal changes related to aging and an age-related decline in some organ functions. The result of medication variances can lead to changes in the pharmacological effect, leading to adverse medication reactions. Risks include impaired cognition and balance, respiratory distress and longer half-lives of medications that could lead to toxicities. Adverse medication events may cause clinically significant morbidity and mortality and are associated with large economic costs.

Purpose:
The objective of this study is to evaluate the prevalence of prescribing potentially inappropriate medications as classified in the Beers Criteria in older patients (age ≥ 65 years) presenting to the Emergency Department (ED) at Parkview Hospital.

Method:
This Institutional Review Board-approved retrospective study included patients ≥ 65 years of age who received Beers criteria medications in the ED between May - October 2010. The number of Beers list medications given during the ED stay and upon ED discharge was collected. Appropriate alternative medications will also be recorded. Based on the findings, education will be developed to inform and educate ED physicians of the Beers criteria and Parkview Hospital’s prescribing rates in older patients. A follow-up assessment will be conducted to determine subsequent prescribing rates of the Beers criteria medications in the ED.

Results:
Results and conclusions to be presented at the Great Lakes Residency Conference.

Learning Objectives:
Discuss potential adverse drug events that may be caused by inappropriate medication prescribing in elderly patients.
Identify medications with a potential benefit in the elderly population.

Self Assessment Questions:
Which of the following medications are included as drugs to avoid in the elderly per the Beers criteria?
A: Biguines
B: Benzodiazepines
C: Aminopenicillins
D: Insulin

Which of the following was one of the top ten medications prescribed in the ED at Parkview Hospital?
A: Amiodarone
B: Cimetidine
C: Mineral oil
D: Ketonolac

Q1 Answer: B   Q2 Answer: A

ACPE Universal Activity Number 121-999-11-142-L01-P
Activity Type: Knowledge-based   Contact Hours: 0.5

REBOUND HYPOTENSION AFTER HYDROCORTISONE DISCONTINUATION IN SEPTIC SHOCK

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Background:
Previous studies and guidelines advocate the use of hydrocortisone (HC) in septic shock patients who remain hypotensive despite fluid resuscitation and vasopressor therapy. Limited data exists regarding hypotensive events after HC discontinuation.

Purpose:
To evaluate outcomes in patients who experience rebound hypotension (RH) after discontinuation of HC with septic shock.

Methods:
This retrospective study evaluated adult patients admitted to the MICU with septic shock from January 2008-May 2010 who received HC 50 mg IV q 6 hours. Patients were divided into two groups: RH vs no rebound hypotension (NRH). RH was defined as systolic blood pressure (SBP) decrease >40 mmHg or SBP <90mmHg within 24 hours of HC discontinuation. P-value <0.05 was considered significant. Data are expressed as mean±SD.

Results:
This study evaluated 32 patients (16 RH vs 16 NRH) with septic shock with a mean age of 61±13 years and APACHE II of 278. Sixteen patients had HC tapered upon discontinuation. No significant differences existed in baseline characteristics between RH vs NRH. A trend towards higher in-hospital mortality was seen in RH vs NRH. In patients who did not receive vasopressin and in patients who were older than 50 years of age who experienced RH.

Conclusions:
In-hospital mortality tended to increase in those patients that experienced RH following HC discontinuation after septic shock. Additionally, an increase in mortality was seen in those patients who did not receive vasopressin in patients who were older than 50 years of age who experienced RH.

Learning Objectives:
Review the literature regarding the use of corticosteroids in the management of critical illness-related corticosteroid insufficiency in the setting of septic shock.
Discuss outcomes in patients who experience rebound hypotension after hydrocortisone withdrawal.

Self Assessment Questions:
The pathophysiology of critical illness-related corticosteroid insufficiency is characterized by which of the following?
A: Exaggerated proinflammatory response
B: Result of decreased cortisol production
C: Tissue resistance to glucocorticoids
D: All of the above

What is the recommended dose of hydrocortisone for a patient with septic shock who has responded poorly to fluids and vasopressors?
A: Hydrocortisone 50 mg every 6 hours
B: Hydrocortisone 100 mg every 6 hours
C: Hydrocortisone 100 mg bolus followed by 10 mg/hour continuous infusion
D: A and C

Q1 Answer: D   Q2 Answer: D

ACPE Universal Activity Number 121-999-11-346-L01-P
Activity Type: Knowledge-based   Contact Hours: 0.5
EVALUATION OF EXTENDED VENOUS THROMBOEMBOLISM (VTE) PROPHYLAXIS WITH ASPIRIN AFTER STANDARD PROPHYLAXIS IF TOTAL HIP AND KNEE REPLACEMENT PATIENTS

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Purpose:
Patients who undergo major orthopedic surgeries (i.e. total hip and knee replacement and hip fracture surgery) are at an increased risk for developing a venous thromboembolism (VTE), and previous studies have shown the risk extends out to 90 days after the surgery even after the recommended duration of VTE prophylaxis. This project aims to evaluate the impact of aspirin on VTE rates after standard VTE prophylaxis in patients who have undergone total hip replacement (THR) surgery, total knee replacement (TKR) surgery, and hip fracture surgery (HFS). The goal of the study is to determine if the rates of VTE decrease in patients using concomitant aspirin after standard VTE prophylaxis with a low molecular weight heparin.

Methods:
This retrospective, nested case control study, approved by IRB, includec Cincinnati VAMC patients (by chart review) who had ICD 9 codes of THR, TKR, or HFS from January 1, 2003 to January 1, 2010. The search determined the date of the orthopedic surgery and extended for six months post operation. A minimum of 200 patients were included in the chart review, which would show a significant difference based on a power analysis. Each case was matched with controls at a ratio of 1 to 1 so the study could reach the desired sample size. From there, patients who were diagnosed with VTE were enrolled as cases, and controls were randomly identified by using the same cohort of patients that the cases were identified from, but were patients who did not have a VTE. Controls were matched to cases based on age and type of orthopedic surgery. Data collection was recorded on a data collection sheet without identifiers and was maintained confidentially.

Results/Conclusion:
To be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Review the risk and incidence a patient has of developing a VTE when undergoing THS or TKS or HFS.
Describe the benefit aspirin has on the incidence in VTE after VTE prophylaxis in patients who are unable to tolerate adequate oral or enteral nutrition.
Recognize the risks and benefits involved with the administration of TPN.

Self Assessment Questions:
What is the risk of a patient developing a DVT confirmed by venography after major orthopedic surgery?
A 0%-20%
B 21%-40%
C 41%-60%
D 61%-80%

What is the risk of a patient developing a DVT after major orthopedic surgery after they have received standard prophylaxis with LMWH?
A 0%
B 5%
C 10%
D 15%

Q1 Answer: C Q2 Answer: B

EVALUATION OF TOTAL PARENTERAL NUTRITION INFECTION RATES IN SICU PATIENTS

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Purpose:
The primary objective of our study was to retrospectively determine and evaluate if there is a difference in the infection rates in SICU patients who receive TPN with and without lipid infusions.

Methods:
This was a retrospective, observational study that included a total of eighty patients receiving TPN after admission to the SICU. Patients were divided into two groups, patients receiving TPN with intravenous lipid infusions (n=40) and patients receiving TPN without lipid infusions (n=40). All patients at least 18 years of age and in which TPN was initiated while in the SICU from the years of 2009-2010 were included. Patients were excluded if they were receiving TPN therapy prior to admission. The presence of infection was assessed by monitoring blood sputum, wound and line cultures along with the initiation of antibiotics from the time of TPN initiation until its discontinuation.

Results/Conclusion:
This study is still under investigation with final results & conclusions to be presented at Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Discuss the common sources of infection associated with the administration of TPN.
Recognize the risks and benefits involved with the administration of TPN.

Self Assessment Questions:
Which of the following has been associated as a source of infection?
A dextrose infusions
B protein infusions
C persistent hypoglycemia
D lipid infusions

TPN can be considered as a lifesaving treatment in patient who cannot tolerate oral/enteral intake. What are the common risks involved with the administration of TPN?
A infectious complications
B increased risk of cancer
C increased risk of obesity
D increased risk of hyperlipidemia

Q1 Answer: D Q2 Answer: A
BASILIXIMAB VS ANTI THYMOCYTE GLOBULIN (ATG) USED AS INDUCTION THERAPY IN RENAL TRANSPLANTATION

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Purpose: Risk for acute rejection is highest in the first year, especially in the first six months after transplantation. ATG is used as first-line induction therapy at The Ohio State University Medical Center (OSUMC), but basiliximab is utilized as a second-line option when ATG cannot be used. In addition to ATG or basiliximab, patients (pts) also receive a rapid steroid taper that is discontinued on post-operative day 5. Pts' maintenance regimen consists of cyclosporine and sirolimus. The objective of this study is to evaluate the efficacy and safety of basiliximab vs ATG used as induction therapy in renal transplantation. The primary outcome is the incidence of biopsy-proven acute rejection (BPAR) at 6 months. Secondary outcomes include the incidence of 6 month graft (GS) and patient survival (PS).

Methods: A retrospective, observational chart review of pts 18-75 yrs old who underwent renal transplantation and received basiliximab or ATG induction between January 1, 2002-March 31, 2010. Basiliximab pts were randomly case-matched to ATG pts based on the time frame of transplant. We calculated that 178 pts would have to be enrolled to have a statistical power of 80% to detect a significant difference between the two grps.

Results: Thirty four pts received basiliximab during the study period and were compared to 144 ATG pts. At 6 months, the incidence of BPAR was 1% in the ATG grp vs 12% in the basiliximab grp (p = 0.0049). PS was greater in the ATG grp (85%) compared to the basiliximab grp (74%, p=0.0765). GS not death censored in the ATG grp was significantly greater vs the basiliximab grp (93% vs 76%, p=0.0055). Additional data collection is currently being completed.

Conclusion: ATG is associated with a significantly lower incidence of BPAR. PS and GS were greater in the pts who received ATG.

Learning Objectives:
Discuss the role of basiliximab and ATG used as induction therapy in renal transplantation.
Describe the efficacy and safety of basiliximab vs ATG used as induction therapy in renal transplantation.

Self Assessment Questions:
Acute rejection is most likely to occur:
A the first day after transplant.
B within the first 6 months post-transplantation.
C within the first 5 years post-transplantation.
D within the first 30 days post-transplantation.

ATG is a:
A monoclonal antibody that induces the uptake of lymphocytes by th
B polyclonal antibody that induces the uptake of lymphocytes by the
C monoclonal antibody that inhibits the mammalian target of rapam
D chimeric monoclonal antibody that blocks the interleukin-2 receptor

Q1 Answer: B  Q2 Answer: A

ACPE Universal Activity Number 121-999-11-088 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

PROCALCITONIN-GUIDED DURATION OF ANTIMICROBIAL THERAPY FOR PATIENTS WITH HEALTHCARE ASSOCIATED PNEUMONIA

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BACKGROUND: Due to the rising rates of antimicrobial resistance it is important to determine optimal duration of antimicrobial therapy to achieve clinical response. Currently, there are limited objective tools to help providers determine duration of therapy. Procalcitonin (PCT) is a FDA-approved biomarker utilized for assessing patient risk for progression from severe sepsis to septic shock. An elevated PCT indicates the presence of infection and necessitates initiation of antimicrobial therapy. It has been evaluated for determining length of antimicrobial therapy for various bacterial infections. Studies have shown that procalcitonin-guided antimicrobial therapy can significantly reduce duration of antimicrobial therapy and has the potential to decrease resistance associated with antimicrobial overuse while achieving clinical response. PURPOSE: To determine the potential benefits of an objective tool to help guide duration of antimicrobial therapy for the treatment of healthcare-associated pneumonia (HCAP), a PCT guideline will be implemented. The difference in duration of antimicrobial therapy for patients with HCAP prior to and post-implementation of PCT guideline will be evaluated to assess effect on antimicrobial duration and cost. Secondary endpoints including hospital length of stay, intensive care unit admission, and mortality will also be evaluated. METHODS: Patients 18 years and older treated for HCAP at Advocate Lutheran General Hospital during January 1, 2008 through October 31, 2010 will be retrospectively reviewed and compared to patients treated for HCAP prospectively from November 1, 2010 through November 1, 2011. Controlling for a 20% drop-out rate, 96 subjects (48 per group) will be included for multiple regression analysis. The primary endpoint will be compared via independent t-test. Secondary endpoints and baseline data will be compared via Chi-squared analysis or Fishers exact test and independent t-tests and Mann Whitney U test. A reduction in duration of antimicrobial therapy by 2.5 days is hypothesized. RESULTS/CONCLUSIONS: In progress

Learning Objectives:
Describe procalcitonins role in determining duration of antimicrobial therapy.
Discuss the impact of utilizing PCT to guide the duration of antimicrobial therapy in patients with HCAP including effect on hospital length of stay, intensive care unit admission, and mortality.

Self Assessment Questions:
Which of the following statements best describes procalcitonin (PCT) in an infectious process?

A PCT is an acute phase reactant for viral infections
B As a biomarker, PCT is sensitive but not specific
C PCT aids in guiding discontinuation of antimicrobial therapy
D: Antimicrobials should be initiated in patients with PCT < 0.1 mcg/L

In which one of the following patients would PCT-guided discontinuation of antimicrobial therapy be most appropriate?

A Patient with healthcare associated pneumonia and PCT = 0.3 mcg
B Patient with documented Pseudomonas aeruginosa pneumonia wi
C Patient with ventilator associated pneumonia who has clinically im
D Patient with documented Acinetobacter baumannii pneumonia wit

Q1 Answer: C  Q2 Answer: C

ACPE Universal Activity Number 121-999-11-116 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
Cisplatin is a platinum analog chemotherapeutic agent that forms inter- and intrastrand DNA crosslinks resulting in DNA denaturation and ultimately, cytotoxicity. However, its nonselective targeting of both malignant and healthy tissue results in side effects that are often dose-limiting or that preclude further administration. Nephrotoxicity is one of the most dose-limiting side effects of cisplatin. Several studies have shown that effective normal saline hydration can reduce or prevent the incidence of nephrotoxicity in patients receiving high dose cisplatin, ranging from 50-75 mg/m². Several clinical studies support the use of hydration to prevent nephrotoxicity, however no standard guideline is in place regarding the amount or duration of hydration. Currently, the outpatient cancer center at UIMC has a standard hydration protocol that applies to cisplatin doses ≥ 75 mg/m². The purpose of this study is to evaluate the efficacy of intravenous normal saline infusion in preventing cisplatin-induced nephrotoxicity in patients receiving chemotherapy in the outpatient setting. The primary objective is to determine whether hydration with intravenous normal saline is effective at preventing cisplatin-induced nephrotoxicity, defined as a serum creatinine (SCr) increase > 0.3 mg/dL, or a SCr increase > 1.5 times baseline SCr, or initiation of dialysis, in patients receiving first-time, high-dose cisplatin chemotherapy at the UIMC outpatient cancer center. This study is a retrospective chart review that has been approved by UIMCs IRB. Patients are included if they are chemotherapy-nave patients who received cisplatin for any type of cancer. Cisplatin dose received must be ≥ 75 mg/m², and patients must have received saline hydration per the UIMC protocol. Descriptive statistics will be used when analyzing primary and secondary objectives data. Data collection for this study is ongoing.

Learning Objectives:
Describe the mechanism of nephrotoxicity caused by cisplatin.
Explain how saline hydration prevents or reduces cisplatin-induced nephrotoxicity.

Self Assessment Questions:
How does cisplatin cause nephrotoxicity?
A: By causing renal artery stenosis
B: By causing post-renal obstruction
C: By direct toxicity to the renal proximal and distal tubules
D: By causing hyperkalemia and hypermagnesemia

What measure prevents or reduces cisplatin-induced nephrotoxicity?
A: Administration of mesna
B: Intravenous saline hydration
C: Slowing the infusion rate of cisplatin
D: Administration of methylene blue

Q1 Answer: C  Q2 Answer: B

Activity Type: Knowledge-based     Contact Hours: 0.5
EVALUATION OF THE CLINICAL AND FINANCIAL IMPACT OF EXTENDED INFUSION PIPERACILLIN-TAZOBACTAM IN CRITICALLY ILL ADULT PATIENTS AT A TERTIARY CARE TEACHING HOSPITAL

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Purpose:
Piperacillin-tazobactam is widely used in critically ill patients at Ministry Saint Joseph’s Hospital (MSJH). Beta-lactam antibiotics exhibit time-dependent antimicrobial activity, where maximum efficacy occurs when the time above the minimum inhibitory concentration is extended. Currently at MSJH, piperacillin-tazobactam is infused over 30 minutes every 6 hours. Literature supports extending piperacillin-tazobactam infusion to 4 hours administered every 8 hours to maximize pharmacokinetic and pharmacodynamic properties. Optimizing existing antibiotics is a key component of antimicrobial stewardship. Additionally, there was increased utilization and overall drug spend for piperacillin-tazobactam at MSJH over the past fiscal year. The primary objective is to compare clinical outcomes of patients receiving piperacillin-tazobactam via intermittent versus extended infusion. The secondary objectives are to assess total daily dosage, number of doses administered per treatment course, and to investigate the potential for cost savings.

Methods:
A retrospective chart review was completed for all patients greater than 18 years old admitted to critical care units between January and March 2010 treated with piperacillin-tazobactam for more than 48 hours. Exclusion criteria included: creatinine clearance less than 20 ml/min (Cockroft-Gault) or infection proven resistant to piperacillin-tazobactam. Data collected included: demographics, laboratory and microbiologic data, vital signs, length of stay in critical care unit and total hospital stay, time to fever resolution, total daily dosage and number of doses per treatment course, concomitant antibiotics, documented adverse events associated with antimicrobial therapy, and MSJH piperacillin-tazobactam expenditure information. A Pharmacy and Therapeutic Committee approved protocol for piperacillin-tazobactam extended infusion was implemented January 2011. Education of nurses, pharmacists and physicians was completed, and an update to smart-pump library occurred prior to initiation. Post-implementation, the impact of extended infusion piperacillin-tazobactam will be evaluated by a second retrospective chart review in a similar patient population. Results:
Final results with conclusion will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Describe the rationale for implementation of extended infusion piperacillin-tazobactam.
Discuss the potential advantages and disadvantages associated with extended infusion antibiotics from a patient and system perspectives.

Self Assessment Questions:
Which best describes the antimicrobial activity of piperacillin-tazobactam?
A: Time dependent and bactericidal
B: Concentration dependent and bactericidal
C: Time dependent and bacteriostatic
D: Concentration dependent and bacteriostatic
All of the following are proposed benefits of extended infusion piperacillin tazobactam, EXCEPT?
A: Increased time bacteria are exposed to antimicrobial
B: Improved patient outcomes
C: Increased daily dosage
D: Decreased drug expenditure
Q1 Answer: A   Q2 Answer: C
ACPE Universal Activity Number 121-999-11-438 -L04-P
Activity Type: Knowledge-based   Contact Hours: 0.5

ASSESSING THE FREQUENCY AND CHARACTERISTICS OF OUTPATIENTS WHO MAINTAIN STABLE INR CONTROL

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Purpose: As the drug of choice when long-term anticoagulation therapy is indicated, warfarin requires continuous dose adjustments and monitoring of the International Normalized Ratio (INR) to ensure optimal therapeutic effect while minimizing bleeding complications. Currently, the American College of Chest Physicians (ACCP) recommends a monitoring interval of the INR of no longer than every 4 weeks. Studies suggest that patients demonstrating stable INR control could be safely treated with less frequent INR monitoring. The primary aim of this study is to determine the frequency of patients who maintain stable INR control for a consecutive 6 month period. An additional aim is to determine which patient characteristics influence INR stability.

Methods: A retrospective medical record review will be conducted at two pharmacist-managed anticoagulation clinics and will include all enrolled patients who are at least 18 years old and have been taking warfarin for at least 15 months. Electronic medical records will be reviewed for general demographic information, INR values, and duration of warfarin therapy. Additionally, bleeding and thromboembolic documented complications will be reviewed. Patients will be divided into two groups based on INR stability for statistical analysis. Stable INR will be defined as INR values exclusively within therapeutic range for a consecutive 6 month period. Using regression analysis, the stable INR group will be further analyzed to assess the association of predefined patient characteristics with stable INR.

Results: The medical record review is under progress. Approximately 750 patients are being screened for eligibility for inclusion in the study. It is anticipated that 50% of patients at each site will have maintained a stable INR for a consecutive 6 month period and will be eligible for inclusion.

Conclusion: Results from this study may support less frequent INR monitoring for patients demonstrating stable INR control.

Learning Objectives:
Review the current American College of Chest Physicians (ACCP) anticoagulation guidelines.
Discuss the literature identifying stable anticoagulation outpatients and discuss which patient characteristics were found to potentially influence INR stability.

Self Assessment Questions:
What is the maximum monitoring interval for International Normalized Ratio (INR) recommended by the ACCP guidelines?
A: 12 weeks
B: 4 weeks
C: 2 weeks
D: 1 week
According to the study performed by Witt, et al, which of the following has been shown to be associated with stable INR control?
A: Heart valve disorder and increasing age
B: Total knee replacement and absence of comorbidities
C: Venous thromboembolism and presence of comorbidities
D: Atrial Fibrillation and increasing age
Q1 Answer: B   Q2 Answer: D
ACPE Universal Activity Number 121-999-11-322 -L01-P
Activity Type: Knowledge-based   Contact Hours: 0.5
EVALUATION OF NAUSEA AND VOMITING CONTROL IN GYNECOLOGIC ONCOLOGY PATIENTS

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Background
Chemotherapy induced nausea and vomiting has been cited as the toxicity most feared by patients. Nausea and vomiting can lead to metabolic disorders, anorexia, decreased quality of life and poor compliance with future regimens which are potentially curative. The most recent National Comprehensive Cancer Network (NCCN) antiemesis practice guidelines were published in February 2010.

Purpose
The primary objective of this study is to assess the control of nausea and vomiting in a group of gynecologic oncology patients receiving chemotherapy. A secondary objective will be to evaluate how well our institution is following current NCCN guidelines in the prevention and treatment of chemotherapy induced nausea and vomiting.

Methods
Educational efforts will be focused on areas of deficiency found in a previous study assessing nausea and vomiting control. One-on-one educational sessions will be completed with the physicians and nursing staff of the gynecologic oncology clinic one month prior to data collection. Data will be collected from over a two month period targeting approximately 50 gynecologic oncology patients receiving a chemotherapy regimen. The level of emetogenic potential will be classified according to the NCCN guidelines. Patients who are pregnant, less than 18 years old, or are currently enrolled in a chemotherapy clinical research trial will be excluded. Data will be collected using the pharmacy order entry database. The following data will be collected for eligible patients: completed Multinational Association of Supportive Care in Cancer (MASCC) antiemesis tool, patient age, chemotherapy regimen, and antiemetic regimen. Results of this study will be used to identify the current control of chemotherapy induced nausea and vomiting. Comparison data from a previous study will be used to evaluate the impact of the educational sessions.

Results/Conclusions
Data collection is ongoing. Results and analysis will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Discuss the NCCN antiemesis treatment recommendations for high, moderate, and low/emetogenic chemotherapy regimens.
Identify the impact of pharmacy provided educational efforts on the prevention and control of chemotherapy induced nausea and vomiting.

Self Assessment Questions:
Which of the following is an appropriate regimen for a patient receiving a moderate emetogenic chemotherapy regimen according to the NCCN antiemesis practice guidelines?
A: NCCN recommends offering a serotonin (5-HT3) antagonist for the
B: Neurkinin 1 antagonist are recommended in all patients receiving
C: Scheduling of a serotonin (5-HT3) antagonist or a steroid on days
D: NCCN recommends scheduling metoclopramide days 1-3 in all pa

Which of the following was observed in regards to the pharmacy provided educational efforts on the prevention and control of chemotherapy induced nausea and vomiting in this study?
A: Improved adherence to the NCCN antiemesis practice guidelines
B: Despite improved adherence to the NCCN antiemesis practice gui
C: No change was seen in the adherence to the NCCN antiemesis pr
D: Pharmacy provided educational efforts did not improve overall ad

Q1 Answer: C  Q2 Answer: A

ACPE Universal Activity Number 121-999-11-095 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5

EVALUATION OF FOURTH-YEAR PHARMACY STUDENT INVOLVEMENT IN AN INPATIENT HOSPITAL WARFARIN MONITORING SERVICE

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Background/Purpose
Anticoagulation therapy with warfarin requires adequate monitoring and assessment to ensure desired therapeutic outcomes. To test our hypothesis we will collect international normalized ratio (INR) data on all patients, not in an intensive care unit, over the age of 18, receiving inpatient warfarin therapy at St Joseph Mercy Hospital-Ann Arbor who had at least four days of monitoring by a pharmacist or pharmacist-precepted student. Time data will be collected for patients who meet the above inclusion criteria regardless of duration of monitoring. Baseline INR and time data will be compared to data collected from patients monitored by a student precepted by a pharmacist. The primary outcomes of the study are number of patients with a subsequent INR greater than 4 not present upon admission and number of patients with a therapeutic INR at the time of discharge. The secondary outcome measure is mean amount of time spent per patient by pharmacists on warfarin monitoring activities.

Results
Results will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Identify appropriate criteria for warfarin monitoring.
Discuss the potential benefits and risks of student participation in warfarin monitoring.

Self Assessment Questions:
Which of the following monitoring parameters is most useful for determining if a patient is receiving appropriate anticoagulation with warfarin?
A: INR
B: PT
C: aPTT
D: Hemoglobin

Which of the following concepts should students understand when monitoring warfarin?
A: Warfarin has a wide therapeutic window
B: The INR for a given day does not necessarily reflect the dose give
C: There are few drug-drug interactions with warfarin
D: Warfarin dosing has little inter-patient variability

Q1 Answer: A  Q2 Answer: B

ACPE Universal Activity Number 121-999-11-345 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
ADDITIONAL FOLLOW-UP PHARMACIST APPOINTMENTS WITH PATIENTS RECEIVING ORAL CHEMOTHERAPY FROM A SPECIALTY PHARMACY

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Purpose

Literature has highlighted the importance of providing patient education and the need for continued medication monitoring throughout treatment with oral chemotherapy. Patients receiving oral chemotherapy often experience adverse drug events that can cause therapy interruptions or dose reductions, as well as negatively impact quality of life. Lau et al. reported 88% of the ten most common adverse drug reactions in oncology patients were predictable and approximately 50% were possibly preventable. This data supports the need for the development of proactive medication monitoring systems to reduce adverse drug events and dose adjustments. There have been few studies examining the role of a pharmacist in assessing and monitoring patients receiving oral chemotherapy. The purpose of this study is to assess the potential impact a pharmacist could have through additional follow-up appointments with patients receiving oral chemotherapy.

Methods

This is a prospective, quality improvement pilot project with the Marshfield Clinic Specialty Pharmacy. Up to thirty patients receiving capecitabine, lapatinib, erlotinib, or sorafenib will be included. In addition to the standard initial and one follow-up encounter, the participants will receive two additional follow-up visits with a pharmacist at two to four week intervals. The pharmacist will assess the participants drug related needs at each appointment and identified drug therapy opportunities will be documented in a standardized database. Descriptive statistics will be used to evaluate the frequency, type, and severity of each drug therapy opportunity. Results of this study will guide quality improvement efforts addressing drug therapy opportunities occurring in patients receiving treatment with oral chemotherapy, as well as determining the potential need for expansion of pharmaceutical care services provided by Marshfield Clinic.

Results/Conclusion

To be presented at the Great Lakes Pharmacy Residency Conference (e.g., most common type of adverse drug events, patient level of adherence, frequency of drug therapy opportunities).

Learning Objectives:

Recognize the developing role of Specialty Pharmacy for patients with cancer, as well as the importance of patient education and continued medication monitoring throughout treatment with oral chemotherapy.

Discuss the type, severity, and frequency of the most commonly occurring drug therapy opportunities in patients receiving oral chemotherapy.

Self Assessment Questions:

What percentage of antineoplastic agents in development are planned to be oral drugs?

A: 10%
B: 25%
C: 33%
D: 50%

According to Lau et al, which of the following is the most common adverse drug reaction occurring in oncology patients?

A: Constipation
B: Diarrhea
C: Fatigue
D: Nausea

Q1 Answer: B    Q2 Answer: A

Activity Type: Knowledge-based    Contact Hours: 0.5

ANTIMICROBIAL STEWARDSHIP PROGRAM: EVALUATING THE PHARMACIST’S IMPACT

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Purpose:

Antimicrobial stewardship programs (ASP) utilize a team of healthcare professionals to combat the direct and indirect costs of antimicrobials by advocating appropriate and cost-effective treatment plans. Munson Medical Center, a 391-bed community teaching hospital, implemented an ASP in 2001 and added a full-time pharmacist in 2010. This study aims to quantify the impact of the addition of a pharmacist to the ASP or cost, local resistance patterns, and number of Clostridium difficile infections.

Methods:

To evaluate the pharmacists impact on the appropriate and cost-effective use of antimicrobial agents, data will be collected before integration of the pharmacist to the ASP team (April-June 2010) and after integration of the pharmacist (December 2010-February 2011). Data collected will include: drug usage using defined daily doses and cost data for vancomycin, tobramycin, gentamicin, piperacillin/tazobactam, aztreonam, and linezolid. In addition, data will be collected on the local resistance patterns and the number of Clostridium difficile infections and compared before and after integration of the pharmacist to the ASP team. Finally, the recommendations made by the ASP team after integration of the pharmacist will be analyzed. Analysis will include: number of recommended changes accepted, changes in antimicrobial therapy leading to a decrease in cost and de-escalation of therapy, and cost savings and estimated change in length of hospitalization.

Results:

After pharmacist integration to the ASP in December 2010, the ASP pharmacist made 36 recommendations regarding antimicrobial selection and 28 were accepted (78%). The results for the comparison between the two time periods (before and after integration of the pharmacist to the ASP) are currently under analysis.

Conclusions:

The pharmacists impact in the ASP team is exemplified by the 78% recommendation acceptance rate in the preliminary data. Final conclusions will be presented pending further analysis of results of this study.

Learning Objectives:

Describe the impact of the Antimicrobial Stewardship Team’s (AST’s) antimicrobial recommendations while a pharmacist was part of the team

Explain the purpose and goals of an antimicrobial stewardship program in a community hospital.

Self Assessment Questions:

What was the impact of the ASTs antimicrobial recommendations while a pharmacist was part of the team?

A: Decrease in cost
B: Increase in cost
C: Increase in infections
D: Decrease in infections

What are the main goals of antimicrobial stewardship programs in community hospitals?

A: Promote the use of broad-spectrum antimicrobials throughout the therapy
B: Promote the cost-effective use of antimicrobials and decrease mic
C: Promote the use of newer, more costly antimicrobials throughout the therapy
D: Promote the cessation of antimicrobial therapy before the patient’s

Q1 Answer: A    Q2 Answer: B

Activity Type: Knowledge-based    Contact Hours: 0.5
CHARACTERISTICS OF SUCCESSFUL ANTI PSYCHOTIC DOSE REDUCTIONS IN NURSING HOME PATIENTS WITH DEMEN TIA-RELATED AGGRESSION OR AGITATION

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Purpose: The prevalence of dementia in Americans in 2001 was estimated to be 2.9 million.1 In some patients symptoms of psychosis, aggression, and sometimes dangerous behaviors towards themselves or others require the use of antipsychotic medications. Because antipsychotics have been shown to carry an increased risk of mortality, the appropriate clinical balance of risk-to-benefit can be challenging to establish. According to the Center for Medicare and Medicaid Services (CMS) guidelines, nursing home patients with certain diagnosis require periodic attempts at antipsychotic dose reductions. These guidelines also require that dosage reduction attempts continue until a patient has demonstrated a clinical need to continue antipsychotics (i.e., worsening symptoms upon dosage reduction). The purpose of this study is to evaluate the outcomes of antipsychotic dose reductions in patients with dementia related psychosis or behavioral disturbances residing in nursing homes, and to identify factors that may increase or decrease the likelihood of successful dosage reductions.

Methods: This is a retrospective study including patient data from approximately 75 patients residing in participating nursing homes from January 2006 to December 2010. Residents aged 65 years and older with dementia related psychosis or behavioral disturbances prescribed an antipsychotic were included. Patients without a diagnosis for dementia or those with a diagnosis of schizophrenia or bipolar disorder were excluded. The following characteristics will be assessed statistically, using chi-square, to discern any possible influence on the likelihood of successful dose reductions: antipsychotic agent, antipsychotic dose, and patient demographics including age, sex, and race. As indicated, additional correlation analysis are also planned for these same variables and outcomes.

Results: Data collection and analysis is ongoing.

Conclusions: Results will be presented at the Great Lakes Pharmacy Residency Conference.

Reference:

Learning Objectives:
Describe the CMS requirements for antipsychotic dose reductions in nursing homes.
Identify a scenario requiring an antipsychotic dose reduction based on CMS guidelines.

Self Assessment Questions:
According to CMS guidelines, which of the following scenarios requires an attempt at dose reduction of the listed antipsychotic?
A A 67 year old female being treated with quetiapine 100 mg PO twice daily for behavioral symptoms.
B A 92 year old male prescribed olanzapine 10 mg once daily for delusions.
C A 62 year old male with bipolar disorder being treated with risperidone.
D A 76 year old female treated with aripiprazole 10 mg PO once daily for agitation.

Of the behavioral symptoms listed, which of the following is considered an acceptable single reason for prescribing an antipsychotic?
A Hallucinations
B Uncooperativeness
C Unsociality
D Wandering

Q1 Answer: B  Q2 Answer: A

EVALUATION OF ENTERAL PHARMACONUTRITION PRACTICES IN PATIENTS WITH ACUTE LUNG INJURY OR ACUTE RESPIRATORY DISTRESS SYNDROME

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Purpose: A primary therapeutic goal for acute lung injury (ALI)/ acute respiratory distress syndrome (ARDS) patients is to improve oxygenation by decreasing inflammation thereby reducing the incidence of organ dysfunction. Patients that receive enteral nutrition therapy with eicosapentaenoic acid (EPA) and gamma-linolenic acid (GLA) exhibit improved oxygenation, fewer days of ventilator support, and decreased length of stay in the intensive care unit when compared to patients who do not. The objective of this study is to determine if adult ALI or ARDS patients that receive an enteral nutrition formula containing EPA and GLA within 48 hours after diagnosis will have improved clinical outcome in comparison to patients in which therapy is delayed.

Study Methods:
A multicenter, retrospective chart review was conducted at a large community hospital system. Patients diagnosed with ALI/ARDS from 2007-2010 were identified using diagnosis-related group (DRG) codes. An electronic medical record system was used to collect data points. A sample size of 176 was determined by a power analysis (95%). Patients were differentiated based on nutrition variables (nutrition status, site of feeding, and feeding tolerance), clinical variables (oxygenation - aPO2/FiO2), demographic variables, and outcome variables (length of stay in hospital and intensive care unit, and time on mechanical ventilation). Data analysis was performed by a multidisciplinary team of dietitians, pharmacists, and pulmonologists. A student t-test was used to determine the effects of early vs. delayed administration time. The primary outcomes that will be evaluated are 1) whether or not patients received enteral nutrition therapy within 48 hours of diagnosis, 2) whether or not goal enteral nutrition rate was achieved. Secondary outcomes include length of stay in the ICU and hospital and time on mechanical ventilation.

Results and Conclusion:
Data collection and analysis currently in progress and will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Describe the benefits of pharmaconutrition therapy in patients diagnosed with acute lung injury or acute respiratory distress syndrome.
Discuss the impact of administering pharmaconutrition therapy early during the course of treatment.

Self Assessment Questions:
Which of the following is considered a pharmaconutrient?
A Boric acid
B Valproic acid
C Eicosapentaenoic acid
D Acetic acid

Which of the following statement(s) is/are correct regarding ALI/ARDS patients that receive pharmaconutrition therapy?
A There is no statistically significant reduction in time on mechanical ventilation.
B Associated with fewer incidents of new organ failure.
C Associated with increased length of stay in the intensive care unit.
D A and C

Q1 Answer: C  Q2 Answer: B

ACPE Universal Activity Number 121-999-11-246 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
MEETING THE MEDICATION SAFETY GOALS OF AURORA HEALTH CARE: DEVELOPMENT OF A MEDICATION SAFETY DASHBOARD

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Purpose: Aurora Health Care is implementing several new medication safety systems within its hospitals, including: smart infusion pumps, barcode medication administration, and online medication event reporting. All of these technologies generate data that is useful for performance improvement. These data should be utilized in safety assessments at individual hospitals and compiled in a standardized format throughout the healthcare system. A medication safety dashboard would give Aurora Health Care a comprehensive tool to systematically review data from each of the new medication safety systems. Such a dashboard would also allow for internal benchmarking between hospitals and improved communication about medication events throughout the healthcare system. The objective of this project is to design and implement a medication safety dashboard for Aurora Health Care to track medication event data from key medication safety systems.

Methods: Reports of medication event data from the smart infusion pumps, barcode medication administration system, and medication event reporting program were evaluated to establish key parameters for monitoring. Appropriate metrics were developed to convey these parameters in a standardized format - a dashboard. Prior to its implementation, training will be provided to assure that the dashboard is consistently and accurately completed. The medication safety dashboard was piloted and will be utilized as each of these technologies is implemented throughout the system. Resources will be established for ongoing collection and analysis of medication safety dashboard data.

Results: A spreadsheet was created to display medication event data side-by-side for each of the Aurora Health Care hospitals. Breakpoint goals were determined for each of the key monitoring parameters, and data was highlighted in green, yellow, or red within the spreadsheet, based on how well that goal was achieved. Final implementation results will be presented at the Great Lakes Pharmacy Resident Conference.

Conclusions: To be presented at the Great Lakes Pharmacy Resident Conference.

LEARNING OBJECTIVES:
Identify the three medication safety systems included in the Aurora Health Care Medication Safety Dashboard.
Identify three key reasons to implement a medication safety dashboard.

SELF ASSESSMENT QUESTIONS:
The following three medication safety systems were included in the Aurora Health Care Medication Safety Dashboard:
A Computerized physician order entry, barcode medication administration
B Medication reconciliation via a pharmacy technician, computerized
C Smart infusion pumps, computerized physician order entry, medication administration online
D Smart infusion pumps, barcode medication administration, online

Which of the following are key reasons to implement a medication safety dashboard in a health system?
A Internal benchmarking, To exert control over medication use at individual level
B Systematic review of medication events, Internal benchmarking, & communication
C Improved communication about events, Systematic review of medication events
D Loss prevention of medications, Systematic review of medication events

Q1 Answer: D Q2 Answer: B

EPIDEMIOLOGY AND MICROBIOLOGY OF ACINETOBACTER BAUMANNII INFECTIONS AT SUMMA HEALTH SYSTEM

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Purpose: Evaluate the epidemiology and microbiology of Acinetobacter infections and colonization at Summa Health System and identify the outcomes of patients with resistant pathogens.

Methods: Patients > 18 years of age admitted with positive cultures for Acinetobacter identified through the microbiology lab at Summa Health System from January 2009 to December 2010. Clinical information will be retrospectively collected by reviewing the Summa Health System databases. Information to be collected will include: patient demographics; length of stay; co-morbidities; antibiotics within the previous 30 days; site of the culture; susceptibility data; and 30 and 90 day mortality data. Colonization versus infection will be determined by a pre-identified set of criteria for pneumonia, urinary tract infection, wound infection or bacteremia. Pulsed-field gel electrophoresis analysis will be used to identify strains that may be linked to certain environmental sources.

Results and conclusions: In progress and to be presented at the Great Lakes Residency Conference.

LEARNING OBJECTIVES:
Recognize patient risk factors for multi-drug resistant Acinetobacter infections.
Discuss the patient outcome data in recent literature for patients with carbapenem resistant versus carbapenem susceptible infections and the rising concerns with resistant isolates.

SELF ASSESSMENT QUESTIONS:
Common risk factor(s) associated with MDR Acinetobacter infections are:
A Prior colonization with Acinetobacter
B ICU admission
C Previous exposure to antibiotics
D All of the above

Choose the correct statement:
A Patients with carbapenem resistant Acinetobacter infections have a longer duration of hospital stay associated with carbapenem sens
B Carbapenem resistance patterns have remained stable since 2002
C To date, there has not been concern with pan-resistant Acinetobacter
D A longer duration of hospital stay is associated with carbapenem resistance

Q1 Answer: D Q2 Answer: A

ACPE Universal Activity Number 121-999-11-146 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
REIMBURSEMENT FOR COGNITIVE AMBULATORY CARE SERVICES PROVIDED BY A PHARMACIST IN A COMMUNITY PHARMACY SETTING

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Statement of Purpose
Billing for cognitive services provided by a pharmacist in an institutional, medically based facility is not a new concept, and services provided within these facilities are often reimbursable. However, billing for such services is widely unrecognized and non-reimbursable by third party payers and CMS for patients receiving these services in ambulatory clinics based in a community, retail pharmacy setting. This research examines the practicality and financial viability of such a practice.

Methods
Patients registered in the Mathes Diabetes Center education program are allowed to voluntarily enroll in the research. Patients are to pay $250 for four, two-hour education seminars, and six, one-hour individualized follow-up consultations. Patients were a $150 credit to be used towards medications copays if they wished to fill their prescriptions at Mathes Pharmacy, enticing patients to have all of their medications filled at Mathes Pharmacy. Many current patients do not use Mathes as their primary pharmacy. Financial costs and monetary gains were assessed through a collection of medication reimbursement rates for patients with an active diagnosis of diabetes.

Preliminary Results Supporting Conclusion
On average, patients enrolled at the Mathes Diabetes Center consume 6.97 medications for chronic disease states requiring monthly refills. The average profit margin of a prescription filled at Mathes Pharmacy is $9/prescription, and blood glucose strips reimburse ~$9/month.

Pharmacists at Mathes Diabetes Center, spend ~26 hours/patient, which includes documentation, patient preparation, education classes, and consultations. The salary for a pharmacist in this position is $60/hour, which equates to $1,560 of pharmacist time spent per patient. Average prescription reimbursement totals $960 per year, including the $250 enrollment fee.

Preliminary Conclusion
A pharmacists salary is $124,800 per year ($60/hr). If 60 patients enroll in the diabetes center prescription program yearly, at the end of 5 years, the Mathes Diabetes Center will profit.

Learning Objectives:
List the potential costs necessary to consider with this type of program when establishing a diabetes program in a community pharmacy setting. Identify the costs associated with diabetes.

Self Assessment Questions:
In 2009, what was the cost of diabetes to the healthcare system?
A: $100 Million
B: $290 Million
C: $260 Billion
D: $580 Billion
Which of the following are costs associated with starting a community based diabetes education program? I. Prescription vials, label paper II. Filling staff pharmacists salary III. Diabetes educator
A: I only
B: II only
C: I and II
D: I, II, and III
Q1 Answer: C Q2 Answer: D

IMPLEMENTATION OF A PHARMACIST-MANAGED WARFARIN DOSING SERVICE AND IMPACT ON PATIENT OUTCOMES

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Background
Warfarin is well-known for its narrow therapeutic window, many drug and food interactions, and as a common cause of hospital admissions. Consequently, there has been a shift in recent decades towards pharmacist-managed outpatient warfarin clinics. Since 2006, St. Elizabeth Regional Health (SERH) has offered outpatient warfarin services through the St. Elizabeth Anticoagulation Clinic (SEAC). Clinica

Patients registered in the Mathes Diabetes Center education program

D: Physicians manage warfarin better than pharmacists
C: Pharmacists do not manage warfarin as well as physicians
B: Pharmacists manage warfarin as well as physicians
A: Pharmacists manage warfarin better than physicians

Q1 Answer: B Q2 Answer: B

ACPE Universal Activity Number 121-999-11-267-L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
RISK FACTORS FOR PREVENTABLE ADVERSE DRUG EVENTS IN A LARGE HEALTH SYSTEM
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A 1999 report from the Institute of Medicine (IOM) highlighted medical errors, including medication errors, as a leading cause of morbidity and mortality.1 Preventable adverse drug events (ADEs) (i.e., medication errors that contribute to patient harm) occur at a rate of almost 2% of inpatient admissions with an estimated national cost of $2 billion annually. The National Coordinating Council for Medication Error Reporting and Prevention (NCCMERP) describes a taxonomy for classifying medication errors based on their effect on the patient (see Table 1).2 Severity A through D errors are not associated with harm; severity E through I errors are associated with harm. It is unclear from current medication safety literature what medication, patient, and provider factors may contribute to an error causing harm. The purpose of this study is to identify risk factors for harm due to a medication error as opposed to a benign medication error.

This was a retrospective, case-control study investigating risk factors for harm in patients experiencing medication errors. All errors reported at Indiana University Health downtown hospitals (i.e., Methodist Hospital, Riley Hospital for Children, University Hospital) with an assigned Severity E through I per standard medication variance review from July 1, 2009 through June 30, 2010 were randomly matched with a Severity ≤ D through E error. Medication error reports and the electronic medical record were reviewed for specific medication, patient, and provider factors. Risk factors for patient harm were identified using logistic regression and multivariate analysis. Additionally, medication errors were assessed for potential preventative technological interventions.

Results and conclusions will be reported following completion of data collection at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Classify a medication error using the NCCMERP taxonomy.
Identify risk factors for harm due to a medication error.

Self Assessment Questions:
Which of the following scenarios represents a preventable adverse drug event?
A A patient received a correct dose of insulin lispro and experienced
B A physician orders insulin lispro 20 units instead of the patient’s ac
C Insulin lispro is administered instead of insulin glargine without a n
D Insulin lispro is stocked in an automated dispensing cabinet (ADC)

Previous cross-sectional studies have suggested increased risk of harm from medication errors in which patient populations?
A Critically ill and hematology/oncology
B Critically ill and pediatrics
C Geriatrics and hematology/oncology
D Geriatrics and pediatrics

Q1 Answer: C Q2 Answer: B

ACPE Universal Activity Number 121-999-11-482 -L05-P
Activity Type: Knowledge-based Contact Hours: 0.5

EVALUATION OF THE INCIDENCE OF CYTOMEGALOVIRUS INFECTION AND DISEASE POST LIVER TRANSPLANTATION WITH PROPHYLACTIC ORAL GANCICLOVIR VS. ORAL VALGANCICLOVIR
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Purpose: Cytomegalovirus (CMV) is the most common viral infection documented after solid organ transplantation (SOT) and is associated with significant morbidity and mortality. Safe and effective prophylactic medication regimens that decrease the incidence of CMV infection and disease are therefore essential. Historically, prophylactic therapy choices at Cincinnati Childrens Hospital Medical Center (CCHMC) have included intravenous and oral ganciclovir. Due to a national shortage of oral ganciclovir, oral valganciclovir is currently being utilized at CCHMC. Although valganciclovir is not FDA approved for CMV prophylaxis in liver transplant recipients, post-marketing studies have shown valganciclovir to be as effective as ganciclovir in high risk adult SOT. The purpose of this study is to determine the incidence of CMV infection and disease in pediatric liver transplant patients treated with oral ganciclovir and valganciclovir to support the use of valganciclovir for CMV prophylaxis in this population.

Methods: This is a retrospective chart review of pediatric (<21 years of age) liver transplant recipients at CCHMC who were prescribed either oral ganciclovir or valganciclovir from 12/2005 until 2/2011, with documented donor/recipient CMV serology prior to transplant. Patients will be followed until death or 120 days post-transplant. Multi-visceral organ transplant recipients and HIV positive patients will be excluded. The primary outcome is to compare incidence of early onset (day +15 to +120) CMV infection and CMV disease between patients treated with oral ganciclovir and valganciclovir. Secondary outcomes include incidence of infection and disease when compared by age, risk stratification based on CMV serology status, incidence of acute graft rejection, sepsis and opportunistic infection as well as incidence of CMV infection or disease from day +120 to day +200. Safety outcomes will also be evaluated.

Results/Conclusions: Final results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Discuss the various CMV donor/recipient serology statuses and their association with the risk of CMV infection and disease.
Describe the FDA approved indications for valganciclovir use in solid organ transplantation.

Self Assessment Questions:
Which donor/recipient CMV serology is associated with the highest risk of acquiring CMV infection or disease?
A D(-)/R(+)
B D(+)/R(+)
C D(-)/R(-)
D D(+)/R(-)

Which of the following is Correct?
A Valganciclovir is not FDA approved for prophylaxis of CMV in pedi
B Valganciclovir is FDA approved for prophylaxis of CMV in any tran
C Valganciclovir is not FDA approved for prophylaxis of CMV in liver
D Multiple studies have shown that valganciclovir is inferior to ganci

Q1 Answer: D Q2 Answer: C

ACPE Universal Activity Number 121-999-11-092 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
EFFECT OF AN EDUCATIONAL INTERVENTION ON ADULT IMMUNIZATION RATES AND MEDICAL RESIDENT KNOWLEDGE OF IMMUNIZATION GUIDELINES

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Purpose: Routine immunizations for vaccine-preventable diseases in the adult population are essential to reduce morbidity and mortality in healthy patients and patients with chronic illnesses. Despite evidence that vaccines are beneficial and cost-effective in adults, use in this population is less than optimal. Three vaccine-preventable diseases in the adult population are pneumococcal disease, tetanus, and herpes zoster. By increasing awareness of vaccine recommendations among physicians, rates of immunization may increase, thereby reducing morbidity and mortality associated with these vaccine-preventable diseases. Primary objectives for this study included assessing baseline adult immunization rates and medical resident knowledge of guidelines for pneumococcal disease, tetanus, and herpes zoster and evaluating a change in immunization rates following an educational intervention. Secondary objectives were 1) determine the presence of any differences in immunization rates based on medical resident or patient characteristics and 2) compare medical resident vaccine knowledge at baseline and post-educational intervention.

Methods: This institutional review board (IRB)-approved pre- and post-intervention, retrospective chart review targeted medical residents at the St. Vincent Joshua Max Simon Primary Care Center (PCC). A chart review focusing on vaccination rates for pneumococcal disease, tetanus and herpes zoster vaccinations was conducted both at baseline and following an educational intervention. Components of the educational intervention included: presenting baseline resident knowledge to residents and posting weekly informational flyers in the PCC focusing on each vaccine. Following this intervention, another chart review was performed to assess changes in vaccine rates. Lastly, a ten question, multiple choice survey was administered at baseline and post-intervention to evaluate a change in resident knowledge of vaccine recommendations.

Results/Conclusions: Data collection is ongoing. Results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Recognize the importance of adult immunizations for vaccine-preventable diseases.
Describe methods that can be used to enhance physicians vaccine administration habits and knowledge of vaccination guidelines.

Self Assessment Questions:
An example of a vaccine-preventable disease with an available vaccine
A Pneumococcal disease.
B Lyme disease.
C Blastomycosis.
D Histoplasmosis.
The most common reason adults do not get appropriately vaccinated is
A Fear of needles.
B Lack of available guidelines for adult vaccinations.
C Cost.
D Lack of vaccine recommendations by a physician.

Q1 Answer: A  Q2 Answer: D

SUSCEPTIBILITY OF ESCHERICHIA COLI TO AMPICILLIN-SULBACTAM IN COMMUNITY-ACQUIRED INTRA-ABDOMINAL INFECTIONS AND OUTCOMES ASSOCIATED WITH ITS USE

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Purpose: Complicated intra-abdominal infections are primarily managed through surgical intervention and adjunctive antibiotic therapy. Guidelines published in 2003 by the Infectious Diseases Society of America (IDSA) and Surgical Infection Society (SIS) recommended using ampicillin-sulbactam for complicated community-acquired infections of mild-to-moderate severity, with the caveat that local Escherichia coli (E. coli) susceptibility profiles should be examined prior to antibiotic selection. However, the 2010 IDSA/SIS guidelines recommend against its use due to widespread E. coli resistance. Two important points should be considered: first, what the resistance of E. coli to ampicillin-sulbactam is in this patient population and how it compares to the data referenced in the guidelines and overall hospital antibiograms; second, whether laboratory resistance to ampicillin-sulbactam reflects clinical efficacy in vivo.

Methods: Patients were identified for inclusion using ICD-9 diagnosis codes in the University HealthSystem Consortium (UHC) Clinical Data Base and screened for final inclusion via retrospective chart review. Adult patients admitted to our institution from January 2007 to December 2009 were included if they were admitted from the community, had a complicated intra-abdominal infection requiring surgical intervention, had been in the hospital <48 hours at infection onset, had cultures obtained during surgery positive for E. coli, and received at least one dose of an antibiotic. The ampicillin-sulbactam susceptibility of E. coli isolated in the study population was compared to that reported in the institutions antibiogram. Outcomes were evaluated for patients who received ampicillin-sulbactam after surgery and whose cultures were positive for resistant E. coli versus susceptible E. coli.

Results/Conclusions: In the 2007-2009 antibiograms, 52% of 5586 E. coli isolates were susceptible to ampicillin-sulbactam. Approximately 39 patients must be identified for the study population to detect a 25% difference between groups with a power of 90%. Data analysis and conclusions are pending and will be completed by the date of presentation.

Learning Objectives:
Explain the role of antibiotics in the treatment of complicated intra-abdominal infections.
Discuss the controversy surrounding the use of ampicillin-sulbactam in patients with complicated community-acquired intra-abdominal infection: of mild-to-moderate severity.

Self Assessment Questions:
What is the most important component of managing complicated intra-abdominal infections?
A Selection of an appropriate antibiotic
B Surgical control of the infection
C Duration of antibiotic therapy
D Beginning antibiotics prior to surgery

Which of the following does the IDSA recommend against using for the treatment or prophylaxis of complicated community-acquired intra-abdominal infections?
A Levofloxacin plus Metronidazole
B Cefazolin plus Metronidazole
C Ampicillin/Sulbactam
D Ertapenem

Q1 Answer: B  Q2 Answer: C

ACPE Universal Activity Number 121-999-11-066 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5

ACPE Universal Activity Number 121-999-11-170 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
THE IMPLEMENTATION OF A NOVEL ASSOCIATE COMMUNICABLE DISEASE EXPOSURE DATABASE ON DOCUMENTATION COMPLIANCE AND ITS EFFECT ON EMPLOYEE PERCEPTION OF OPERATIONAL EFFICIENCY

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Exposures to communicable diseases have become a concern for healthcare workers given the recent H1N1 pandemic and resurgence of pertussis. OhioHealth currently have policies in place for responding to associate exposures to communicable diseases; however this process is muddled in extensive paper trails, leading to inefficiency and poor documentation. Implementation of health information technology can significantly streamline complex systems through enhanced access to vital information. Important factors to consider in the exposure process: identifying associates, authorizing treatment, dispensing medication, and follow-up. Currently, an effective system does not exist that allows for easy communication between healthcare members throughout the exposure process. The primary objective of this study is to evaluate the effect of implementation of an associate exposure database on operational efficiency as determined through employee perception. The secondary objective will measure the effect of the database on documentation compliance as compared to the preceding paper-based system.

This is an observational study designed to assess the effect of a novel database on user perception of efficiency as well as documentation. The study has been submitted to the Institutional Review Board for approval. An electronic database for recording exposures has been created and implemented; pre-packaged medications specific for disease types have been created and approved, and policies and procedures have been developed to reflect the new process that will be used throughout OhioHealth. Education has been provided to all staff members involved with the operation of the database and any accompanying processes. Surveys will be distributed to end-users of the system that will assess their perception on improvement to the system, if any; the database has contributed. A retrospective review of documentation compliance has been assessed during the paper system to establish a baseline. Documentation compliance will be measured after implementation of the associate exposure database and compared to established baseline.

Learning Objectives:
Recognize the impact of a communicable disease associate exposure database on operational efficiencies.
Identify the effect of health information technology on documentation compliance and record keeping.

Self Assessment Questions:
Health information technology has the ability to enhance which of the following when implemented appropriately?
A User error
B Standardization of workflow
C Incomplete documentation
D Poor communication

Electronic documentation during an associate exposure provides an advantage over that of a paper based system in which of the following areas?
A Increased non-compliance with documentation
B Variation in operational workflow
C Legibility of documentation
D Delayed patient follow-up

Q1 Answer: B  Q2 Answer: C

ACPE Universal Activity Number 121-999-11-415-L04-P
Activity Type: Knowledge-based  Contact Hours: 0.5

EVALUATION OF GENDER ON TREATMENT DIFFERENCES IN PATIENTS HOSPITALIZED FOR ACUTE DECOMPENSATED HEART FAILURE

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Purpose: Literature has demonstrated that treatment differences exist between men and women for various cardiovascular diseases such as mitral valve prolapse and myocardial infarction. Heart failure is the leading cause of hospitalization for patients aged 65 and older demonstrating the importance of selecting the appropriate therapy to treat patients. The objective of this study was to compare inpatient treatment differences among men and women for the management of heart failure.

Methods: This was a retrospective, cohort study. The study groups were stratified based on gender. Inclusion criteria were as follows: an ICD-9 code of 428.X, administration of a loop diuretic during the first 24 hours, and BNP >500 pg/ml. Patients were excluded if admitted to the hospitals critical care units at anytime during their stay. The primary outcome was a composite of treatment differences, defined as: 24-hour diuretic dose after admission relative to home dose (greater than=2; less than or equal to=1; n/a=0); number of up-titrations of initial diuretic needed (yes=1; no=0); and vasodilator and/or inotropic use (yes=1; n=0).

Secondary outcomes included: length of stay, total emergency department diuretic dose, total urine output for 24 hours, net weight reduction, maximum serum creatinine (SCR), increase in SCR from baseline, and need for additional diuretics.

Results: A total of 100 patients were evaluated (51 women). The composite primary outcome scores were men 1.900.743 and women 2.000.612. There was a trend towards a higher number of up-titrations in the men group (p=0.0704). In the first 24-hours of admission, 22 men and 21 women received a diuretic dose higher than their home dose [44.8% vs. 42.9%; p-value=0.707]. Only 15 men and 20 women received up-titrations on this diuretic dose [30.6 vs. 39.2; p-value=0.367]. Vasodilator and inotropic use was low in each group. There was a trend toward a longer length of stay for women.

Conclusion: There was no effect of gender on treatment differences in patients hospitalized for acute decompensated heart failure.

Learning Objectives:
Describe potential treatment differences that exist among men and women for the inpatient management of heart failure.
Review the current recommended treatment algorithm for the inpatient management of heart failure.

Self Assessment Questions:
Which of the following statements is true?
A There is no evidence of gender treatment differences for cardiovascular disease.
B There is evidence that gender treatment differences exist for myocardial infarction.
C Women are more aggressively treated for myocardial infarctions than men.
D More women receive surgery for mitral valve prolapse than do men.

Which of the following is the first-line treatment option for a patient with acute decompensated heart failure who presents as warm/wet?
A Furosemide and dobutamine
B Dobutamine and nitroglycerin
C Furosemide only
D Dobutamine only

Q1 Answer: B  Q2 Answer: C

ACPE Universal Activity Number 121-999-11-156-L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
EFFECT OF PREVIOUS EXPOSURE TO FLUOROQUINOLONES ON CROSS RESISTANCE AND GRAM NEGATIVE SEPSIS MORTALITY

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Gram negative infections in critically ill patients can progress rapidly and are associated with significant ICU mortality. Data suggests that mortality increases with every hour that antimicrobials are delayed, thus making it imperative to select appropriate initial antimicrobials. Studies have correlated previous use of antimicrobials with an increased likelihood of resistance to the same agent, however few have assessed the effects of cross resistance amongst antimicrobial classes. As fluoroquinolones are frequently used in the community, hospital, and intensive care unit setting, these agents are prone to overuse and may play a significant role in subsequent resistance to other antimicrobials.

The authors set out to determine if previous exposure to fluoroquinolones is associated with an increase in microbiologic resistance and in-hospital mortality among patients with gram negative septic shock.

This was a retrospective, single-center study based on a database from a large academic medical center. Patients who had previously received fluoroquinolones were compared to patients who had not received fluoroquinolones. The primary endpoint was in-hospital mortality. Secondary endpoints were also assessed and included appropriateness of initial antibiotic therapy, proportion of multi-drug resistant organisms, and proportion of organisms resistant to piperacillin-tazobactam, ceftazidime, and carbapenems. Data was collected on appropriateness of antimicrobial selection, time to antimicrobial administration, severity of illness, organ dysfunction, and gram negative pathogen. A total of 752 adult patients with gram negative infections were reviewed. Of these, patients with previous exposure and utilization of piperacillin-tazobactam, ceftazidime, and carbapenems as well as those without polymicrobial infections were excluded. 606 patients were included in the final data analysis; 85 patients who were previously exposed to fluoroquinolones and 521 patients who were not exposed. In-hospital mortality was collected for all patients and adjusted for confounding variables. Complete results and conclusions of this analysis are in-progress.

**Learning Objectives:**

Define antimicrobial cross resistance.
Recognize the effect of previous fluoroquinolone exposure on cross-resistance and in-hospital gram negative sepsis mortality.

**Self Assessment Questions:**

Which of the following best defines antimicrobial cross resistance?

A: Use of a given antimicrobial confers resistance of other antimicrobials
B: Use of a given antimicrobial antagonizes the effects of a concomitant
C: Use of a given antimicrobial confers future resistance to the same
D: Use of a given antimicrobial produces immune-mediated reactions

Previous exposure to fluoroquinolones in patients with gram negative sepsis may result in which of the following?

A: Decrease in in-hospital mortality
B: Increase in cross-resistance to broad spectrum antimicrobials
C: Increase in immune-mediated allergic reactions to other antimicrobials
D: Decrease in need for broad spectrum antimicrobials

Q1 Answer: A  Q2 Answer: B

**ACPE Universal Activity Number** 121-999-11-247-L01-P

**Activity Type:** Knowledge-based  **Contact Hours:** 0.5

**PHARM.D. DISCHARGE COUNSELING AFTER RECENT HOSPITALIZATION**

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**Background:**

Nationally, adverse drug events (ADEs) cause over 700,000 emergency room visits resulting in about 120,000 hospital admissions each year. This causes over $3.5 billion of extra medical costs for ADEs annually. People who take multiple medications and are over 65 years of age are twice as likely to experience ADEs accounting for over 177,000 emergency room visits annually. Patients recently discharged from the hospital are at an increased risk of medication errors, including formular substitution issues, dose and regimen changes, and overall polypharmacy issues. The physicians and pharmacists at Westshore Family Medicine (WSFM) began a trial procedure of post-discharge pharmacist-initiated phone calls for Mercy and Hackley hospitals in Muskegon, MI.

**Purpose:**

To decrease adverse drug events and readmission rates, and increase patient safety and satisfaction.

**Methods:**

Patient lists from WSFM are forwarded to the pharmacists daily. Patients are further evaluated for phone call follow-up if they are greater than 55 years old or have greater than 5 maintenance medications. The pharmacy resident and pharmacists at WSFM are responsible for calling these patients within three days of discharge to assess the patient for drug-related problems, including but not limited to: discrepancies between home medications and discharge medications, therapy duplication, adverse events, and adherence issues, with the goal being to find these errors or concerns before the patient sees the physician. A note is then placed in the chart for the doctor to review, and patients would follow up with the Pharm.D. or their primary care physician as needed. Primary outcome measures included emergency room visits and hospital readmission within 30 days. Number and type of medication errors found were documented to determine trends, and patient satisfaction was determined using follow-up questionnaires.

**Results:**

Data collection currently in progress and will be presented at the Great Lakes Pharmacy Residency Conference.

**Learning Objectives:**

List common discharge-related medication issues possible with medications when a patient is discharged from the hospital.

Explain the importance of post-discharge pharmacist phone calls on patients recently discharged from the hospital.

**Self Assessment Questions:**

Which of the following is the most common problem found by pharmacists making discharge phone calls?

A: Medication omission
B: Allergic reactions
C: Medication duplication
D: Inconsistent doses

Who is at the greatest risk of medication errors?

A: Patients who are over 65 years old
B: Patients who are less than 30 years old
C: Patients taking more than 5 maintenance medications
D: A and C

Q1 Answer: A  Q2 Answer: D

**ACPE Universal Activity Number** 121-999-11-489-L05-P

**Activity Type:** Knowledge-based  **Contact Hours:** 0.5
VASOPRESSOR DOSING IN OBESE SEPTIC PATIENTS
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Purpose: Obesity is a rising problem in the United States that increases risk of morbidity and mortality. Management of critically ill obese patients is often challenging, particularly in terms of medication management and optimization. Few recommendations exist for dosing medications commonly used in the critical care setting in obese patients. It is unknown whether drug dosing related factors affect outcomes in this patient population. The study objective is to determine if vasopressor dosing and total amount of fluids affect attainment of surrogate endpoints in obese septic patients. Obese patients on continuous sedation protocols will also be analyzed to determine dosing requirements of fentanyl and midazolam, affect on target sedation scores, and total time on the ventilator.

Methods: Prospective, observational analysis of septic patients on vasopressors admitted to the medical or surgical ICU starting in October 2010. Patients are included if they are septic with a recorded MAP of less than 65 prior to vasopressor initiation. Patients will be included in the subgroup if they are mechanically ventilated and on continuous sedation with fentanyl/midazolam. Patients are excluded from subgroup analysis if they are receiving paralytics, comatose, or are in status epilepticus. The PI will obtain a list of ICU patients with active vasopressor orders using an alert review in Theradoc. Baseline MAP, time to MAP of greater than/equal to 65, initial vasopressor dose and the dose at the time of MAP attainment will be recorded. Additionally, the amount of fluids given for resuscitation, baseline CVP, and time to goal CVP will also be recorded. The PI will at no time intervene on initiation or titration of vasopressor therapy. Patients will be divided into two groups for data analysis based on median weight and analyzed for time to target attainment.

Demographics, Results, and Conclusions: To be presented

Learning Objectives:
- Explain the effect of obesity on pharmacodynamic and pharmacokinetic parameters.
- Discuss fluid requirements, vasopressor dosing, and sedation/analgesia requirements in obese septic patients.

Self Assessment Questions:
- Lipophilic drugs are associated with which of the following in obese patients?
  - A: Increased volume of distribution
  - B: Shorter half life
  - C: Increased half life
  - D: A and C

Which of the following is not an outcome associated with critically ill obese patients?
- A: Prolonged mechanical ventilation
- B: Decreased incidence of ICU acquired infections
- C: Increased risk of deep vein thromboembolism
- D: Increased risk of pulmonary embolism

Q1 Answer: D  Q2 Answer: B

THE EFFECT OF A COMMUNITY PHARMACY LIFESTYLE MANAGEMENT PROGRAM ON BLOOD PRESSURE, WEIGHT AND BODY MASS INDEX.
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The role of pharmacists across practice settings is changing. As automation increase and reimbursements decrease it becomes ever more important for progression of pharmacists from a dispensing role to a clinical role. Although pharmacy school education is changing to prepare pharmacists for more clinical positions, research is still needed to prove to importance of pharmacists as healthcare providers.

The purpose of this study is to measure the change in blood pressure, weight and body mass index from baseline in patients who previously participated in a community pharmacy lifestyle management program. Other point of care tests may have been obtained in these are included as secondary outcomes. This is a retrospective, single-center, non-randomized study. Study patients include all patients who previously participated in the Take Charge program at the study site. The study site is an independently owned community pharmacy. The hypothesis of this study states participation in Take Charge, a pharmacist run lifestyle management program, will lead to improved blood pressure, weight and body mass index. Data will be collected by chart review of all patients Take Charge profiles. During a patients participation in the program data was collected in an online program. Data will be pulled from this program and logged on to a spread sheet. The collected data will be analyzed using appropriate statistical tests. For nominal data a t-test or chi-squared will be used, for ordinal data the Wilcoxon-Mann-Whitney test will be used, and for continuous, paired data the paired t-test will be used.

Learning Objectives:
- Recognize the clinical role of pharmacists in community practice.
- Outline the characteristics of the Take Charge program.

Self Assessment Questions:
- Which of the following is pushing pharmacists toward increased clinical roles?
  - A: Decreased automation
  - B: Increased healthcare costs
  - C: Slow pace of drug development and literature publication
  - D: Consistent models of pharmacy

Which of the following is a characteristic of the Take Charge program?
- A: The program is 15 weeks in length
- B: Participants meet with a nurse practitioner weekly
- C: Participants replace 2 meals daily with shakes
- D: The program cannot be geared toward specific disease states

Q1 Answer: B  Q2 Answer: C

ACPE Universal Activity Number 121-999-11-402-L04-P
Activity Type: Knowledge-based  Contact Hours: 0.5
EVALUATION OF THE EFFECTS OF MIDAZOLAM ON PAIN CONTROL IN PATIENTS UNDERGOING BURN DRESSING CHANGE!

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Purpose: Burn pain is one of the most excruciating types of pain a person can experience and it remains one of the most challenging to treat. It is imperative that burn patients receive adequate pain management to prevent the long-term physical and psychological consequences that can result from uncontrolled burn pain. The intensity of pain associated with dressing changes often makes it the most difficult to manage. The anxiety that can develop with dressing changes may have a cyclical relationship with procedural pain and benzodiazepines may be effective in reducing procedural pain by reducing procedure-related anxiety. On July 15, 2009, the Burn Center at The Ohio State University Medical Center implemented the use of midazolam during dressing changes for patients admitted to the burn floor who are unable to tolerate pain or have significant anxiety associated with dressing changes. The objective of this study is to evaluate the use of midazolam as an adjunctive therapy during burn dressing changes and the effect of midazolam on the overall opioid requirements of burn patients.

Methods: This was a retrospective cohort study that evaluated burn patients who received midazolam during dressing changes between July 15, 2009 and December 31, 2010. Each midazolam patient was matched to 3 control patients who underwent burn dressing changes without midazolam between June 1, 2006 and June 30, 2009. Matching criteria included age, sex, total body surface area (TBSA), and the need for grafting. Exclusion criteria included burns ≤ 5% of TBSA, hospital admission < 7 days, surgical intensive care unit admission > 48 hours, and control patients who received benzodiazepines during admission. The primary endpoint was the total oral morphine equivalents required during seven days of inpatient care after initiation of midazolam.

Results and Conclusions: Patient outcomes remain under investigation, with data collection and evaluation currently being conducted.

Learning Objectives:
Classify the three types of pain associated with burn injuries.
Identify the properties that make midazolam an ideal agent to control anxiety and pain during burn dressing changes.

Self Assessment Questions:
What type of burn pain is the most difficult to treat?
A: Background Pain
B: Procedural Pain
C: Neuropathic Pain
D: Breakthrough Pain

Which of the following properties make midazolam an ideal agent to use during burn dressing changes?
A: Long duration of action
B: Delayed onset of action
C: Presence of active metabolites
D: Short duration of action

Q1 Answer: B  Q2 Answer: D

ACPE Universal Activity Number 121-999-11-080 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5

RETROSPECTIVE ANALYSIS OF THERAPEUTIC UNFRACTIONATED HEPARIN INFUSIONS IN MORBIDLY OBESE PATIENTS

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There is limited literature regarding the appropriate dosing of intravenous unfractionated heparin in morbidly obese patients, classified as a body mass index (BMI) of greater than or equal to 40 kilograms per meter squared. The objective of this study was to identify an appropriate initial infusion rate of unfractionated heparin in this patient population to achieve a therapeutic activated partial thromboplastin time (aPTT).

Prior to initiation, this study will be presented to the institutional review board for approval. The institutions electronic medical record will be utilized to identify patients who had previously received infusions of unfractionated heparin for a period of greater than twenty-four hours with a goal therapeutic aPTT of 56-86 seconds. Patients who were less than 18 years of age, greater than 85 years of age, pregnant, or those who did not follow the institutions heparin protocol will be excluded from the study. The following data will be collected: medical record number, age, sex, height, weight, BMI, admitting service, attending physician, indication for heparin, administration of a heparin bolus, rate of heparin infusion (units/kg/hr and units/hr), aPTT values, and the number of supratherapeutic aPTTs, within the first 24 hours will be evaluated. This data will then be utilized to identify an appropriate initial infusion rate of unfractionated heparin for morbidly obese patients and incorporated into the institutions heparin protocol. Preliminary results are pending and will be presented at the conference.

Learning Objectives:
Describe the current trend of obesity in the United States.
Discuss the current literature evaluating the use of heparin infusions in morbidly obese patients.

Self Assessment Questions:
Which of the following statements is correct?
A: The percent of obese patients throughout the United States has re
B: The percent of obese patients throughout the United States has dr
C: The percent of obese patients throughout the United States has dr
D: The percent of obese patients throughout the United Stated has sl

Which of the following statements summarizes the current literature available regarding the topic of heparin infusions in morbidly obese patients?
A: There is no literature to date that evaluates the use of heparin infu
B: There is one retrospective review that evaluates the use of heparin
C: There are multiple studies, including randomized trials, that evalu
D: There are many studies, including randomized trials, that evaluate

Q1 Answer: B  Q2 Answer: B

ACPE Universal Activity Number 121-999-11-333 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
ASSESSING THE IMPACT OF SELECTIVE SEROTONIN REUPTAKE INHIBITOR (SSRI) USE ON THE EFFECTIVENESS OF CLOPIDOGREL THERAPY FOLLOWING CORONARY STENT PLACEMENT

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Purpose:
Clopidogrel is used to prevent recurrent ischemic events following percutaneous coronary intervention (PCI) with stent placement including restenosis, myocardial infarction, and stroke. Recent evidence suggests that patients receiving concomitant therapy with a proton pump inhibitor (PPI) and clopidogrel post coronary stent placement may have an increased risk of experiencing significant adverse cardiovascular events. The proposed mechanism is a decrease in antiplatelet effect due to the inhibition of clopidogrels conversion to its active metabolite by the cytochrome P450 (CYP) isoenzymes 2C19 and 3A4. It is currently unknown whether commonly used medications with similar enzyme inhibition profiles, such as selective serotonin reuptake inhibitors (SSRIs), produce a similar effect. This study will attempt to determine if there is an increase in major cardiovascular events in patients receiving concurrent SSRI and clopidogrel therapy versus patients taking clopidogrel without an SSRI following PCI with stenting.

Methods:
This is a retrospective chart review study. Gundersen Lutheran Medical Centers electronic health records were used to identify patients who underwent coronary stent placement based on ICD-9 codes. Patients were eligible if they were hospitalized for a PCI with stenting and were discharged on clopidogrel. A patient chart review was used to determine if patients were also discharged on an SSRI and whether a major cardiovascular event, defined as a hospitalization for a stroke, transient ischemic attack, myocardial infarction, sudden cardiac death, coronary artery bypass grafting, or stent restenosis, occurred during a follow up period of 12 months. Data such as type of stent, concurrent medications coexisting disease states, and cardiac history were also collected for each patient to help identify potential confounding factors.

Results and Conclusions:
Data collection was completed in January 2011 and data analysis is ongoing. Final results with conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:
Describe the proposed mechanism by which SSRIs may decrease clopidogrels antiplatelet effect.
Identify the SSRI s with the highest CYP 2C19 inhibition.

Self Assessment Questions:
By which mechanism of biotransformation is clopidogrel converted into its active metabolite?
A: Reduction
B: Cytochrome P450-mediated oxidation
C: Glucuronidation
D: Hydrolysis

Which SSRI has the highest CYP 2C19 inhibition?
A: Fluoxetine
B: Sertraline
C: Fluvoxamine
D: Citalopram

Q1 Answer: B Q2 Answer: C

ACPE Universal Activity Number 121-999-11-126-L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

ASSESSMENT OF HOME BASED PRIMARY CARE CLINICAL PHARMACY SERVICES
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Purpose:
Home Based Primary Care (HBPC) is a Veterans Administration (VA) sponsored home health program. Richard L. Roudebush VA Medical Center currently employs one HBPC clinical pharmacist who works remotely with 0.4 full-time equivalents. On July 28th, 2010 additional pharmacy services were piloted placing a pharmacist on-site with HBPC staff one day a week. The purpose of this study is to assess the HBPC clinical pharmacy services provided by the on-site pharmacist in terms of workload, interventions, and HBPC staff, patient and caregiver opinions of pharmacy home visits.

Methods:
The study design involves three components. Component one involves a retrospective chart-review of all HBPC pharmacy interventions made by the on-site pharmacist. Component two is a HBPC staff survey to evaluate perceptions of clinical pharmacy services provided to home care staff and patients. Component three includes patient and caregiver surveys administered prior to and after visits made by the clinical pharmacist.

Preliminary Results:
Initial review of pharmacy interventions (n=81) showed a recommendation acceptance rate of 74% with the most commonly rejected recommendation being additional lab monitoring (37.5% acceptance rate). Lab monitoring, inhaler use and medication compliance were the most frequent recommendations made after miscellaneous recommendations. The HBPC staff survey (n=12) indicated that 50% of staff use a pharmacist as their primary source of drug information. The top three most valued services provided by a clinical pharmacist were medication therapy management recommendations to the patients provider, specific disease state education and review of the medication regimen with the patient. Patient and caregiver surveys will be assessed upon completion of the study.

Preliminary Conclusions:
Clinical pharmacy interventions are well accepted by providers. However, the financial impact of these interventions has not been assessed. The HBPC staff appears to value the clinical pharmacist and are in support of continued and increased services.

Learning Objectives:
Describe the primary difference between home based primary care at the VA and other home health programs.
Identify opportunities for pharmacists to expand services in home based primary care.

Self Assessment Questions:
What is the primary difference between HBPC at the VA and other home health programs?
A: provides acute care in focused areas
B: provides longitudinal care for chronic disease states
C: non-institutional long-term care providing primary care in the home
D: a and c

List current "hot topics" in the medical field that are addressed by pharmacists involvement in home health.
A: Medication Therapy Management
B: Medication Reconciliation
C: Medical Home Model
D: All of the above

Q1 Answer: D Q2 Answer: D

ACPE Universal Activity Number 121-999-11-283-L04-P
Activity Type: Knowledge-based Contact Hours: 0.5
Purpose:
The Cleveland Clinic heart transplant protocol was recently revised to recommend oral, rather than intravenous administration of calcineurin inhibitors (CNIs) in heart transplant recipients post-operatively. The protocol was changed because many transplant patients experience renal dysfunction in the post-operative period despite good kidney function prior to surgery. This decline in function is often multi-factorial including hypotension during and after surgery, being on the bypass pump, as well as CNI exposure. Although CNI induced nephrotoxicity is explained by several mechanisms, the route of administration may be a contributing factor and should be considered.

Methods:
A retrospective, non-interventional medical record review to evaluate adult heart transplant recipients receiving CNI therapy immediately post-operative from January 1, 2008 to February 28, 2011. Heart transplant recipients who received induction therapy (i.e. thymoglobulin or basiliximab) will be excluded. The following data will be collected: demographics, renal function (i.e. BUN and serum creatinine), immunosuppression dosing, and rejection episodes. The primary outcomes of the study will include: change in renal function during hospital admission, time to reach target trough level, episodes of rejection within the first three months of transplant, and time CNI therapy was held due to renal dysfunction. Data analysis will include descriptive statistics and paired t-test for continuous data.

Results:
Data collection for this research is currently ongoing. Results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
List the factors associated with the development of acute nephrotoxicity in heart transplant recipients. Describe the proposed mechanisms of calcineurin inhibitor associated acute nephrotoxicity.

Self Assessment Questions:
All of the following factors are associated with the development of acute nephrotoxicity in heart transplant recipients EXCEPT:
A Bypass pump
B Hypotension
C Calcineurin inhibitors
D Gender

Which characteristic(s) best describe calcineurin inhibitor associated acute nephrotoxicity?
A Irreversible
B Dose-dependent
C Reversible
D B and C

Q1 Answer: D Q2 Answer: D

EXPANSION OF MEDICATION THERAPY MANAGEMENT (MTM) SERVICES FOR ELIGIBLE PATIENTS
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Purpose:
MTM services offer patients a one-on-one discussion with the pharmacist about medications and disease states. It also offers an opportunity for the pharmacist to assess patient adherence, understanding of medications, and appropriateness of medication regimens. All Aurora Pharmacies are providing patients with targeted intervention programs (TIPs), interventions targeted by Outcomes Pharmaceutical Health Care (Outcomes). Currently Aurora Sinai Medica Center (ASMC) Pharmacy does not offer comprehensive medication reviews (CMRs). The objective of this study is to increase the number of TIPs and CMRs offered by ASMC Pharmacy and to create a financially and operationally sustainable MTM service.

Methods:
The clinic pharmacist will be trained in Outcomes and MTM services. Physicians and clinic staff will be educated on the importance of MTM services. Patients from three ASMC clinics eligible for MTM services through Outcomes will be identified and enrolled. A communication strategy with the physicians will be developed. The pharmacist will perform the CMRs and communicate recommendations to the patient and physician. A questionnaire will be administered to patients to assess the MTM service and feedback will be collected from the physicians and clinic staff. An assessment will be made to determine what impact the service has on the number of MTM services provided. The service will be reviewed for sustainability and potentially expanded at the site.

Preliminary results:
Eligible patients were enrolled into Outcomes software and clinic staff/physicians were educated about MTM services. A patient satisfaction survey was created to assess efficacy of MTM services. Baseline data demonstrated Aurora Sinai Medical Center Pharmacy provided 12 TIPs and no CMRs in 2010. In December 2010, 67 patients were eligible for MTM services at the three ASMC clinics. CMR visits are currently being scheduled.

Conclusions:
To be completed at a future date.

Learning Objectives:
Define medication therapy management services. Review the efficacy of MTM services provided in an ambulatory clinic.

Self Assessment Questions:
Medication therapy management (MTM) includes:
A Comprehensive medication review
B Changing medication regimens without physician consultation
C Avoiding patient questions and concerns
D Working independently

Comprehensive medication reviews provided at Aurora Sinai Medical Center Pharmacy ______ from 2010 to 2011.
A Decreased
B Remained the same
C Increased
D Unable to determine

Q1 Answer: A Q2 Answer: C
CREATION AND IMPLEMENTATION OF A PSYCHOPHARMACOLOGY CONSULT TEAM IN A COMMUNITY MENTAL HEALTH CENTER

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PURPOSE: As the long-term burden of care for the severely mentally ill population has transitioned from the institutionalized setting to the community setting, there have been numerous strategies employed to optimize patient outcomes. Outpatient clinics and Assertive Community Treatment (ACT) teams are two strategies that provide these services. Medicaid reimbursement is currently in a fee-for-service model, but is expected to shift toward a patient outcome-directed model which means patient improvement will need to be illustrated. Therefore the current philosophy of keeping the severely mentally ill population "stable" will no likely satisfy this new reimbursement model. This study will evaluate the utilization and acceptance of a newly created Psychopharmacology Consult Team (PCT) consisting of three clinical pharmacists and a psychiatrist.

METHODS: A select number of adult outpatients who were receiving care from Midtown Community Mental Health Center and referred to the PCT via the patients treatment team will be included in the sample. A referral form including the patients current medications, symptoms, and barriers for improvement will be evaluated, as well as information collected from the patients medical records and direct team reports. The PCT will review the referral form to assess the appropriateness for evaluation by PCT. If the patient is deemed appropriate, the PCT will make recommendations to the treatment team to modify the psychopharmacology regimen. These recommendations will be recorded on a data sheet and in the patients electronic medical record. The types of recommendations, percentage of recommendations accepted, and changes in the Adult Needs and Strengths Assessment (ANSA) scores of patients from pre-PCT referral to post-PCT referral will be evaluated.

RESULTS/CONCLUSION: Results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

- Explain the rationale for the creation of a Psychopharmacology Consult Team at Midtown Community Mental Health as it relates to Medicaid.
- Describe the intervention strategies used by the PCT.

Self Assessment Questions:

The primary Medicaid based reason for the creation of a PCT is to:
A. Reduce the number of clinic visits per patient per year
B. Decrease the psychiatrists’ case load
C. Promote the use of generic medications over brand name medicat
D. Demonstrate patient outcome improvements in a new outcome-directed model

One of the major intervention strategies employed by the PCT is:
A. Promoting the use of conventional antipsychotics over atypical antipsychotics
B. Recommending the use of long acting injection formulations of antipsychotics
C. Eliminating the use of clozapine
D. Encouraging the use of multiple oral antipsychotics

Q1 Answer: D  Q2 Answer: B

ACPE Universal Activity Number 121-999-11-209-L04-P
Activity Type: Knowledge-based  Contact Hours: 0.5

DOCUMENTATION OF SURGICAL SEALANT USE IN THE OPERATING ROOM

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Purpose: Surgical sealants, hemostats, and adhesives are important therapeutic options for surgeons to use to maintain hemostasis in the surgical field. These products are designed to work in situations where traditional surgical techniques may not be effective. These products are FDA approved as either biologics or devices. FDA approval categories and product specific storage conditions have lead to different committees evaluating and approving these products at the Ohio State University Medical Center (OSUMC). A Surgical Sealant Workgroup convened to improve sealant documentation and charge capture, evaluate the organizations sealant approval process, identify and remove redundant and low use products, and educate end users to improve product utilization. The Workgroup identified documentation as a safety and compliance concern. An audit revealed that half of patients who were charged for a surgical sealant had these products documented. The Workgroup added a field to the operating room documentation program (OR Web) to aid documentation of surgical sealants and educated operating room staff on this change. The goal of this study is to describe the impact of end user education on documentation of surgical sealants in the operating room.

Methods: A retrospective review of patients charts billed for a surgical sealant was performed after software modification and education. The proportion of patients charts with the same surgical sealant documented as was billed was compared to the initial audit. Purchase data will be compared to billing data for the three months before and after the intervention to evaluate the effect on charge capture.

Results: Preliminary results indicate the proportion of patients charts charged for a surgical sealant with proper documentation of surgical sealants has improved from 50% to 80%.

Conclusions: End user education in the operating room improved documentation of surgical sealants. Reinforcement of this requirement may further improve compliance.

Learning Objectives:

- Describe the different FDA approval categories of surgical sealants, hemostats, and adhesives and their implication on organization inventory, inclusion and supply chain.

Discuss the importance of documentation of surgical sealants.

Self Assessment Questions:

Documentation of surgical sealants is a safety concern because:
A. They are expensive products and the organization needs to be paid
B. They have been associated with adverse events such as sterile abscesses
C. As a rule if we do not document their use, their use did not occur
D. They all contain animal products which can cause hypersensitivity

Surgical sealants are approved by the FDA as:
A. Drugs or Biologics
B. Biologics or Tissue Products
C. Devices or Drugs
D. Biologics or Devices

Q1 Answer: B  Q2 Answer: D

ACPE Universal Activity Number 121-999-11-454-L05-P
Activity Type: Knowledge-based  Contact Hours: 0.5
SAFETY AND Efficacy OF Conversion FROM NPH Insulin TO Insulin Glargine IN PATIENTs WITH Type 2 Diabetes

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Purpose: Previous studies provide evidence that insulin glargine reduces the risk of hypoglycemia in type 2 diabetes compared to NPH, but improvement in glycemic control and cost-effectiveness remain uncertain. This study compares glycemic control, risk of hypoglycemia, and cost-effectiveness after conversion from NPH to glargine in type 2 diabetes.

Methods: This is a retrospective, within-group comparison of a primary care, veteran population with type 2 diabetes who switched from NPH insulin to glargine. The electronic medical record system will be used to collect data. Patients are eligible if they are >18 years old with type 2 diabetes, with at least 12 months of data for NPH and glargine, and if at least one hemoglobin (Hgb) A1C value is available in each section. The primary outcome is the difference in mean A1C values. Secondary outcomes include differences in mean fasting blood glucose (FBG), mean total daily dose (TDD) of insulin, and cost of therapy. Safety outcomes include difference in average number of hypoglycemic episodes reported per patient, total ER visits, and total hospital admissions for hypoglycemia. This study is approved by the Indiana University Purdue University of Indiana (IUPUI) IRB and the VA hospitals IRB.

Preliminary Results: 206 patients were randomly reviewed from a list of 1,155. Of those, 65 met inclusion criteria. Data collection has been completed on 27 patients to date. A significant proportion of patients (~90%) were male, had dyslipidemia, and/or had hypertension at baseline. NPH data showed a mean Hgb A1C of 8.7%, FBG 193mg/dL, and TDD 112 units. Total cost of NPH prescriptions was $3,341. Glargine data demonstrated a mean Hgb A1C of 8.8%, FBG 173mg/dL, and TDD 104 units; total cost of prescriptions was $18,108. Both group subsets had an average of one episode of hypoglycemia per patient.

Conclusions: Pending at time of submission.

Learning Objectives:
- Identify the purported advantages of insulin glargine relative to NPH insulin based on their pharmacokinetic profiles.
- Recall what current literature suggests regarding glycemic control, risk o hypoglycemia, and cost comparing insulin glargine and NPH insulin.

Self Assessment Questions:
Which of the following is/are purported advantages of insulin glargine vs NPH insulin based on their pharmacokinetic profiles?
- A: Faster onset of action
- B: No risk of hypoglycemia
- C: Lower risk of hypoglycemia
- D: Both A and C

Which of the following statements is correct?
- A: Current literature clearly supports that NPH insulin improves glycere
- B: Current literature shows that insulin glargine reduces the risk of hy
- C: Meta-analyses indicate that use of insulin glargine can lower hemic
- D: Data clearly shows that switching from NPH insulin to insulin glarg

Q1 Answer: C Q2 Answer: B

ACPE Universal Activity Number 121-999-11-231-L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

ANALYSIS OF OUTPATIENT DRUG UTILIZATION AND COSTS AMONG FACILITIES WITHIN A VETERANS INTEGRATED SERVICE NETWORK

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Background:
Medical facilities in the Veterans Health Administration are organized into 21 separate Veterans Integrated Service Networks (VISNs). The Lexington VAMC is grouped under VISN 9, which includes facilities in Kentucky, West Virginia, and Tennessee. VA outpatient prescription drug cost and utilization data is recorded in real time using VA software. That data is subsequently loaded into a centralized data storage warehouse which is updated on a monthly basis. This data is used to determine and track to what extent each facility is meeting performance measures.

Purpose:
The purpose of this practice management project is to develop a systematic method to compare outpatient drug utilization and cost among the facilities in VISN 9 utilizing ProClarity software. The results of this comparison will allow for the identification of areas where drug utilization or drug cost reporting can be improved within the Lexington VAMC.

Methods:
Lexington VAMC outpatient drug cost data was analyzed using ProClarity Desktop Professional (2007 ProClarity Corporation). The primary analysis will identify which classes of medications represent the largest portion of total drug cost for the Lexington VAMC. Subsequent analyses will compare the Lexington VAMC data to other facilities within VISN 9 with regard to unit cost of medications, product selection, non-formulary drug use, and prescribing patterns. Finally, reported unit drug costs from ProClarity will be compared to actual drug costs available from the drug distributor to test the validity of ProClarity drug cost reporting.

Results: In Progress

Learning Objectives:
- Recognize factors that can lead to differences in reported drug costs among VA facilities.
- Explain the importance of accurate data in the setting of drug cost reporting.

Self Assessment Questions:
Which of the following would be affected by inaccurate outpatient pharmacy cost reporting?
- A: Meeting PBM performance measures
- B: Outpatient drug budget
- C: Potency of prescription drug products
- D: A and B

Q1 Answer: B Q2 Answer: D

ACPE Universal Activity Number 121-999-11-417-L04-P
Activity Type: Knowledge-based Contact Hours: 0.5
EFFECT OF PHARMACIST-LED INTRAVENOUS TO ORAL ANTIBiotic CONVERSION IN A COMMUNITY-ACQUIRED PNEUMONIA CARE PATHWAY

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Purpose:
Community-acquired pneumonia (CAP) is a common but potentially lethal disease despite the availability of potent antimicrobial agents and effective vaccines. According to the National Vital Statistics, pneumonia (combined with influenza) is the eighth leading cause of death in the US and accounts for 1.1 million hospital discharges annually. The national average length of stay for all pneumonia patient is 5.0 days, average length of stay in Medicare patients is 5.8 days, and yet at St. Marys Hospital, the average length of stay for these patients is currently 6.45 days. A new CAP Care Pathway was established by a multidisciplinary team to complement the current Antibiotic Stewardship Program by utilizing the decentralized pharmacist and other members of the health care team. The goal of the pathway is to standardize and streamline the patients progress through the four major phases (admission, the switch from intravenous to oral antibiotics, discharge, and outpatient follow-up). The purpose of this study is to create and evaluate an evidence-based, pharmacist-led program to switch from intravenous to oral antibiotics in patients admitted for CAP (Phase 2 of the CAP Care Pathway).

Methods:
In this prospective study, all patients admitted to the pulmonary floor of St. Marys Hospital from February 1, 2011 to February 28, 2011 on the CAP Care Pathway will be included. A pharmacist will assess the patient at 24 hours post-admission for criteria to switch from intravenous to oral antibiotics. Measured outcomes include duration of intravenous antibiotic therapy, length of stay, and readmission rate. A retrospective review of all CAP patients admitted to the pulmonary floor in February 2010 will serve as historical control.

Results:
Results and conclusions to be presented at the Great Lakes Residency Conference.

Learning Objectives:
Discuss how a pharmacist-led program to switch from intravenous to oral antibiotics can affect patient quality measures such as duration of time on intravenous antibiotics, length of stay, and readmission rate. Identify criteria that pharmacists should monitor in CAP patients to decide if they can be switched from intravenous to oral antibiotics.

Self Assessment Questions:
According to the National Vital Statistics, what is the national average length of stay for all pneumonia patients?
A 5.0 days
B 5.4 days
C 5.8 days
D 6.45 days

Which of the following are criteria that a pharmacist should monitor when assessing a patient readiness to switch from intravenous to oral antibiotics?
A Temperature
B Ability to tolerate oral intake
C White blood cell count
D All of the above

Q1 Answer: A Q2 Answer: D

ACPE Universal Activity Number 121-999-11-427 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5
IMPLEMENTATION OF TRIGGER TOOL METHODOLOGY TO IMPROVE IDENTIFICATION OF HARMFUL MEDICATION ADVERSE EVENTS
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Purpose: Traditional efforts to detect medication adverse events have focused on voluntary reporting and tracking of errors. Through these efforts, it has been established that only 10-20 percent of errors are ever reported and of these, 90-95% cause no harm to the patient. Current reporting efforts within Lutheran Hospital are marginal and improvements in the identification of medication adverse events are needed. The objective of this project is to implement a new process for the identification of harmful medication adverse events and to identify process improvement opportunities to help reduce these events over time.

Methods: A randomized list of 20 patients who have been discharged for at least 30 days will be supplied by medical records for review at the beginning of each month. A retrospective review will take place and serve as the source of medication adverse event data collection. A core team of 2 PGY1 residents, two nurses, two pharmacists and a physician champion will oversee the process implementation. A nationally recognized, evidence-based global trigger tool program was used in the development of an institution specific trigger tool worksheet for use during chart review to help improve possible adverse event identification. Upon review, chart reviewers will discuss their findings and come to a consensus conclusion regarding each chart and identified adverse events. Documentation and tracking of identified adverse events will be done utilizing a Microsoft access database. Identification of process improvement initiatives to help reduce future events is expected once the implementation and documentation period has been established.

Results/Conclusions: Data collection and evaluation currently in progress. Results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Describe the role that both residents and pharmacists can have in the enhanced identification of medication related adverse events.
Recognize the National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) classification scheme for categorizing errors.

Self Assessment Questions:
It is estimated that what percentage of medication errors are currently reported utilizing traditional efforts focused on voluntary reporting and tracking?
A 30-40%
B 50-60%
C 10-20%
D 1-5%

Which of the following NCC MERP categories represents medication adverse events that result in actual harm to the patient?
A A-I
B B-G
C A-D
D E-I

A COMPARISON OF TWO ENOXAPARIN REGIMENS FOR VENOUS THROMBOEMBOLISM PROPHYLAXIS IN CRITICALLY-ILL OBESE PATIENTS
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Purpose: Enoxaparin is a low molecular weight heparin commonly used for venous thromboembolism (VTE) prophylaxis in hospitalized patients. The manufacturers recommended dose of enoxaparin is 40 mg once daily, regardless of patient weight. Recent literature has indicated increased doses of enoxaparin may be necessary to achieve adequate VTE prophylaxis in morbidly obese patients. Current VTE prophylaxis guidelines do not recommend specific dose increases for obese patients, merely stating that larger doses of enoxaparin may be necessary. In September 2010, our institution implemented an order set recommending an enoxaparin dose of 40 mg twice daily for patients weighing greater than or equal to 150 kg. The purpose of our study was to compare the safety and efficacy of enoxaparin 40 mg twice daily in obese patients to the standard dose of 40 mg daily.

Methods: This was a retrospective chart review covering the time period of June 10, 2010 through December 31, 2010. Patients were included if they were at least 18 years of age, weighed greater than or equal to 150 kg and stayed in one of the intensive care or stepdown units during their hospitalization. Patients were excluded if they were receiving therapeutic anticoagulation, not receiving enoxaparin for VTE prophylaxis or were diagnosed with a hypercoagulable state. The group of patients receiving 40 mg of enoxaparin once daily as prophylaxis was compared to the group receiving 40 mg of enoxaparin twice daily as prophylaxis using the following endpoints: rates of thromboembolic events, rates of major hemorrhage and rates of readmission due to thromboembolic events within 30 days of discharge.

Results/Conclusions: Data collection and analysis currently in progress and will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Review current literature and guidelines available to guide the dosing of enoxaparin in obese patients.
Discuss data regarding the safety and efficacy of higher doses of enoxaparin used for venous thromboembolism prophylaxis in obese patients.

Self Assessment Questions:
Which of the following statements regarding the dosing of enoxaparin for prophylaxis in obese patients is correct?
A Studies have shown that obese patients do not require increased doses of enoxaparin
B Multiple guidelines recommend using weight based dosing strategies
C Current guidelines and literature do not make a unified recommendation
D Obese patients definitely do not require higher enoxaparin doses

Previous studies of increased doses of enoxaparin for prophylaxis in morbidly obese patients have demonstrated that:
A Increased doses provide a higher level of protection, but cause significant bleeding
B Increased doses are not more effective than standard doses, but cause less bleeding
C Increased doses appear to provide a superior level of protection and reduce bleeding
D Increased doses are not more effective and do not cause more bleeding

Q1 Answer: C Q2 Answer: C

ACPE Universal Activity Number 121-999-11-336-L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
IMPLEMENTATION AND EVALUATION OF PHARMACY SERVICES IN THE PERIOPERATIVE AREAS

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Purpose: Despite the numerous high alert and expensive medications used in the perioperative areas, little evidence exists to show that having pharmacists available in these areas are beneficial. The purpose of this project is to implement and evaluate pharmacists service in the perioperative areas including the number and types of interventions made on antibiotic orders, development of a strategy for managing high cost medications, and assessing staff satisfaction with pharmacists service in the perioperative areas.

Methods: Data on antibiotic orders were collected over a 2 week period for perioperative areas. The surgical prophylaxis antibiotic ordered, surgery performed, time administered prior to incision time, closure time and interventions the pharmacist made on these orders were recorded. Compliance rates with Surgical Care Improvement Project (SCIP) measures will be compared pre and post OR pharmacist position implementation. Using drug purchase data for the perioperative areas albumin was a high expense medication targeted for a medication utilization evaluation. Data from the evaluation was used to develop a cost reduction strategy for the use of albumin in the perioperative areas. An electronic survey was administered to the perioperative staff to determine their satisfaction with the pharmacists service implemented in the perioperative areas.

Results: IRB exemption was obtained for the data collection. Preliminary data without a dedicated OR pharmacist show less than a 3% intervention rate on surgical prophylaxis antibiotic orders.

Conclusion: Final analysis of the data will be presented at Great Lakes Residency Conference.

Learning Objectives:
Describe the impact of implementing a dedicated pharmacist in the perioperative areas.
Describe the perioperative staffs satisfaction of pharmacist service.

Self Assessment Questions:
How does a dedicated OR pharmacist effect the interventions made on antibiotic orders?
A Decreases intervention rate
B Increases intervention rate
C No change to intervention rate
D Interventions are more difficult

How does the perioperative staff value the pharmacist services provided
A Not valuable, should be removed
B Beneficial, but could be improved
C Irreplaceable, great addition to OR staff
D Too early to determine

Q1 Answer: B Q2 Answer: C

ACPE Universal Activity Number 121-999-11-370-L04-P
Activity Type: Knowledge-based Contact Hours: 0.5

Efficacy of Prophylactic Amiodarone in Decreasing the Incidence of Post-Operative Atrial Fibrillation in Cardiac Surgery

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Postoperative atrial fibrillation (POAF) is a common complication in patients undergoing isolated or combined coronary artery bypass grafting (CABG) and valvular surgery. A prior study conducted at OSUMC determined the frequency of POAF was 20.1% and the most common risk factors for POAF development were type of cardiac surgery and age. In May 2009, a protocol for prophylactic amiodarone was established at OSUMC. Patients who do not meet exclusion criteria receive amiodarone 400mg twice a day orally for 5 days prior to surgery and 200mg daily for nine days post-operatively. The purpose of this study is to compare the incidence of POAF in patients who received prophylactic amiodarone and had an isolated or combined CABG and valvular surgery to a historic control.

The Society of Thoracic Surgeons (STS) database will be utilized to identify eligible patients for inclusion who are age ≥18 or ≤89 years and undergoing CABG, valvular surgery, or both from May 1, 2009 through September 30, 2010. Patients with a history of atrial fibrillation preoperatively will be excluded from the analysis. Data will be collected via the STS database, patient charts (if necessary), electronic medical record, and the institutional Information Warehouse (IW). Data to be collected include demographic data, comorbidities, procedure details, medication use (pre- and post-operative beta blocker, inotrope use for >24 hours), Euroscore, and time/date of development of POAF. The primary outcome is the incidence of POAF. Secondary outcomes include hospital length of stay, morbidity, mortality, and reasons for discontinuing amiodarone. Assessment of these outcomes will determine if the addition of prophylactic amiodarone reduced the incidence of POAF.

Data collection is in progress. The results and conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:
Identify the risk factors for development of postoperative atrial fibrillation (POAF) in patients undergoing cardiac surgery.
List the medications that prior studies have shown to reduce the incidence of POAF in patients undergoing cardiac surgery.

Self Assessment Questions:
Common risk factors for the development of POAF in patients undergoing cardiac surgery include
A Younger age
B Male
C Combination of CABG and valve surgery
D Low ejection fraction

The addition of which treatment has been shown in prior studies to significantly reduce the incidence of POAF in cardiac surgery patients?
A Diltiazem
B Sotalol
C Propafenone
D Beta blockers

Q1 Answer: C Q2 Answer: D

ACPE Universal Activity Number 121-999-11-094-L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
EVALUATION OF RIFAXIMIN FOR THE TREATMENT OF ACUTE HEPATIC ENCEPHALOPATHY IN CRITICALLY ILL PATIENTS

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Purpose:
Hepatic encephalopathy (HE), a common complication of hepatic cirrhosis, reflects a spectrum of neuropsychiatric abnormalities seen in patients with liver dysfunction after exclusion of other known brain disease. Most strategies for treatment of HE focus on avoiding precipitating factors and treating episodes as they occur with therapies directed at reducing the nitrogenous load (e.g., ammonia) in the gut. Nonabsorbable disaccharides, like lactulose, are most commonly employed. Rifaximin is a semisynthetic, nonsystemic, broad spectrum antibiotic, making it an appropriate choice for eliminating the anaerobic and aerobic bacteria in the intestinal tract, which are believed to be responsible for the production of ammonia. Currently, there are no published data evaluating the use of rifaximin for HE in critically ill patients. This study will help to identify factors associated with appropriate and responsible utilization of rifaximin in the treatment of acute HE at University Hospital.

Methods:
This is a single-center, retrospective, cohort study of critically ill patients with HE admitted to an intensive care unit treated with either rifaximin-based therapy or lactulose monotherapy for at least 96 hours. Patients were identified using hospital and pharmacy billing databases. A total of 150 patients will be included in this analysis. The primary outcome is change in blood ammonia concentrations and modified West Haven Criteria scores between patients receiving rifaximin-based therapy and those receiving lactulose monotherapy within 96 hours of therapy initiation. Secondary outcomes include estimation of differences in HE-related drug and hospital costs as well as identification of global independent predictors of response (specific ammonia and modified West Haven Criteria score thresholds of change) in critically ill patients with HE receiving rifaximin or lactulose.

Results:
Data collection and analysis is ongoing. Results will be presented at the Great Lakes Pharmacy Residency Conference.

Self Assessment Questions:
What is the most common cause of acute liver failure in the United States?
A: Hepatitis B
B: Hepatitis C
C: Acetaminophen
D: Alcoholic hepatitis

What is the most effective agent to treat or prevent hepatic encephalopathy?
A: Neomycin
B: Rifaximin
C: Vancomycin
D: Flumazenil

Q1 Answer: C  Q2 Answer: B

ACPE Universal Activity Number 121-999-11-348 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5

IMPACT OF PHARMACIST MEDICATION PROFILE REVIEW IN SENIOR EMERGENCY DEPARTMENT

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Purpose:
To evaluate the effectiveness of the current screening criteria for medication profile review by a pharmacist for patients seen in the Senior Emergency Department at St. Joseph Mercy Hospital in Ann Arbor, MI.

Methods:
This was a retrospective, observational study from November 1st, 2010 to November 30th, 2010. Patients were identified via registration logs and the following data was collected: patient age and gender, chief complaint, co-morbidities, home medication list, primary care physician, and residence (home, assisted living, extended care facility). For patients with pharmacist note posted, registration time, pharmacy referral time, time of the recommendation posting, type of recommendation made. For patients who were screened using the Triage Risk Screening Tool (TRST) and did not meet high risk criteria, the investigators performed a retrospective medication review and made recommendations in the same way as would have been done in real time. All patients had a second medication list review conducted by a clinical pharmacy specialist to ensure that recommendations were at a consistent level of detail.

Results:
In progress

Self Assessment Questions:
The proportion of seniors re-admitted to the hospital within 90 days of discharge:
A: Less than 15%
B: Greater than 50%
C: 34%
D: 20%

The concept of poly-pharmacy includes
A: Inappropriate prescribing
B: Drug-drug interactions
C: Drug-food interactions
D: Adverse drug effects

Q1 Answer: C  Q2 Answer: A

ACPE Universal Activity Number 121-999-11-485 -L05-P
Activity Type: Knowledge-based  Contact Hours: 0.5
Review the current literature pertaining to vancomycin dosing in pediatric patients at St. John Hospital and Medical Center (SJHMC). The results of this MUE indicated that the initial vancomycin dose (average = 45 mg/kg/day) achieved a serum trough concentration of 10-20 mcg/mL in only 22% of the patients. After a dose adjustment (average = 57 mg/kg/day), 50% of patients achieved a serum trough concentration of 10-20 mcg/mL. Based on these results and data from previous literature, the vancomycin dosing policy in pediatric patients at SJHMC was changed. Vancomycin will be initiated at a dose of 60 mg/kg/day, and dosed by pharmacists according to pharmacokinetic parameters. This study will evaluate the updated vancomycin dosing policy to determine if the new dosing regimen results in a higher percentage of pediatric patients achieving a vancomycin serum trough concentration of 10-20 mcg/mL than under the previous dosing regimen.

Methods:

This is an observational, prospective study. Patients will be identified using the pharmacy database reporting system at SJHMC. Pediatric patients 1 month to 18 years who receive IV vancomycin while hospitalized will be included if they have an appropriate vancomycin serum trough concentration recorded. Any patient in the neonatal intensive care unit (NICU) will be excluded. Medical records and pertinent dosing information will be collected and reviewed. Information will also be collected to determine whether the new dosing regimen causes any adverse events. Patient charts will be evaluated from January 1, 2011 through June 30, 2011.

Conclusions:

Data collection and analysis are ongoing. Results will be presented at the Great Lakes Pharmacy Resident Conference.

Self Assessment Questions:

What is the current MIC susceptibility breakpoint for vancomycin for S. aureus isolates?

A: ≤ 2 mg/L
B: ≤ 4 mg/L
C: ≤ 8 mg/L
D: ≤ 16 mg/L

According to IDSA recommendations, what is the goal vancomycin serum trough concentration for severe infections?

A: > 10 mcg/mL
B: > 20 mcg/mL
C: 10-15 mcg/mL
D: 15-20 mcg/mL

Q1 Answer: A  Q2 Answer: D

ACPE Universal Activity Number  121-999-11-079 -L01-P

Activity Type: Knowledge-based  Contact Hours: 0.5
CLINICAL OUTCOMES OF URINARY TRACT INFECTIONS DUE TO CANDIDA SPECIES IN PATIENTS WITH REDUCED RENAL FUNCTION

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Urinary tract infections caused by Candida species represent an increasingly common source of nosocomial infection. There are few published studies which examine outcomes of patients with reduced renal function who develop Candida UTIs. This purpose of this study is to evaluate clinical outcomes of patients with reduced renal function (CrCl < 50 ml/min) who developed UTIs with Candida species as compared to patients with CrCl ≥ 50 ml/min.

Patients were identified through an institutional laboratory report consisting of patients with positive urine cultures for Candida and screened to determine if they met inclusion criteria for chart review. From January 1, 2009 through December 31, 2010, patients ≥18 years old with or without an indwelling catheter with a urine culture positive for Candida who received ≥ 1 dose of an antifungal therapy were included. Exclusion criteria were the presence of fungemia, bacteremia, or bacteriuria documented within 24 hours of the fungal urine culture, intra-abdominal surgery, SIRS, acute renal failure, hypersensitivity to antifungal therapy and change in concurrent antibiotic therapy or the addition of new antibiotic therapy during antifungal treatment. Patients with a creatinine clearance <50 ml/min were compared to patients with a creatinine clearance ≥50 ml/min. Data collected included age, gender, height, weight, and relevant past medical history. Fungal culture history, signs and symptoms of infection, including the presence of white blood cells, leukocyte esterase and casts in the urine, temperature >100.8 F, WBC ≥10,000/mm3, and symptoms of pain, frequency or urgency upon urination were recorded. Those who received ≥1 dose of an antifungal therapy were included in the analysis.

Learning Objectives:
Identify factors associated with the development of Candida urinary tract infections.
Select an appropriate treatment regimen in response to a Candida urinary tract infection.

Self Assessment Questions:
Which of the following is most closely associated with the development of a Candida urinary tract infection?
A. Structural urinary tract abnormality
B. Antibiotic use within the previous 30 days
C. Use of systemic corticosteroids within the previous 30 days
D. Intra-abdominal surgery within the previous 30 days

Which of the following would be the most appropriate treatment regimen for a patient with a CrCl of 30 ml/min who is diagnosed with a Candida parapsilosis urinary tract infection?
A. Fluconazole 800mg IV Q48h
B. Flucytosine 500mg PO Q48h
C. Fluconazole 100mg PO daily
D. Micafungin 100mg IV daily

Q1 Answer: B  Q2 Answer: C

ACPE Universal Activity Number 121-999-11-339 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5

CONTROLLING HYPERGLYCEMIA THROUGH BASAL-BOLUS DOSE BASED PROTOCOLS IN NON-CRITICALLY ILL PATIENTS AT ST. JOSEPH MERCY OAKLAND (SJMO)

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Background/Purpose:
Hyperglycemia is an increasingly important challenge facing hospitals today. There is mounting evidence that shows controlling hyperglycemia, even for a short period of time, can have a significant impact on a patients health. Guidelines from the American Association of Clinical Endocrinologists (AACE) and the American Diabetes Association (ADA) state that the preferred regimen of insulin for noncritically ill patients should include scheduled subcutaneous insulin, with basal, correctional, and nutritional components. Sliding scale insulin, as the sole regimen, is not recommended.

The current standard of care for glycemic management in non-critical patients at SJMO is not consistent throughout the hospital. There is no system or protocol that allows for easy prescribing of scheduled insulin with basal, nutritional, and correctional insulin. The use of sliding scale insulin only regimens is common and has the potential to cause harm to the patient. The goal of this study is to utilize basal-bolus based insulin regimens through a multi-disciplinary effort to improve patient glycemic control.

Methods:
This is an Institutional Review Board approved, single-center, prospective, observational study in parallel with performance improvements aimed at utilizing basal-bolus based insulin regimens. A protocol was developed and implemented through informational packets and in-services. The study investigators will determine patients who qualify for the study and follow the protocol to dose insulin for diabetic patients on noncritical patient care units at SJMO. The comparator group is the patients on the same units who are not admitted under a participating physician and receive the standard of care for SJMO. Patient eligibility is determined by a predefined set of inclusion and exclusion criteria. Outcomes include mean blood glucose level during hospitalization, critically high blood glucose measurements, and hypoglycemic measurements.

Results:
Data collection is currently ongoing. Results and analysis will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Explain the concept of basal-bolus insulin regimen.
Identify the benefits of basal-bolus over sliding-scale only insulin dosing regimens in noncritically ill patients that are hospitalized.

Self Assessment Questions:
Which insulin would be the best choice for the basal insulin in basal-bolus insulin regimen?
A. Regular insulin
B. Detemir insulin
C. Aspart insulin
D. Glulisine insulin

The AACE and ADA recommend which of the following insulin regimens for inpatient noncritically ill patients?
A. Basal, nutritional, and a supplemental (correctional)
B. Sliding scale correctional only
C. Nutritional and basal only
D. Basal, supplemental (correctional), and sliding scale

Q1 Answer: B  Q2 Answer: A

ACPE Universal Activity Number 121-999-11-276 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
FACTORS ASSOCIATED WITH HEART FAILURE READMISSIONS
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Purpose: Approximately 5.8 million people in the United States have heart failure (HF). The estimated direct and indirect cost of HF in the United States for 2010 is $39.2 billion, with $20.9 billion for direct hospital costs. Patients seen in Department of Veterans Affairs (VA) facilities with HF average almost two hospitalizations annually and have readmission rates as high as 43%. The understanding of the precipitants that contribute to exacerbations of HF is of great importance to clinicians. Understanding the avoidable precipitants could favorably influence HF disease management. Previous studies have identified several factors that may lead to increased readmissions that are modifiable, such as use of evidence-based heart failure therapies, adherence to medications and diet, medication reconciliation, discharge instructions, post-discharge follow-up and social factors. The primary objective of this study is to identify modifiable factors that contribute to multiple readmissions among patients with heart failure at Louis Stokes Cleveland VA Medical Center.

Methods: Retrospective chart review of patients with heart failure who had three or more admissions between November 2009 and November 2010, with at least one of the admissions coded for heart failure as the primary diagnosis. Patients will be excluded if they have insufficient medical records for gathering data, do not have heart failure as a contributing issue on any of the admissions or if they are hospice patients. The data regarding patient demographics, comorbidity, discharge medications, left ventricular systolic function, adherence, discharge instructions, post-discharge follow-up and social factors will be documented for each of the patients admissions.

Results/Conclusions: Data collection and analysis is ongoing. Results will be presented at the Great Lakes Pharmacy Residency Conference.

IMPLEMENTATION OF A STANDARDIZED BASAL-BOLUS INSULIN ORDER SHEET IN ADULT NON-CRITICAL MEDICAL PATIENTS AT A COMMUNITY TEACHING HOSPITAL
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Purpose: Sliding Scale Insulin (SSI) is a reactive, non-physiologic approach to glucose control often resulting in large shifts in blood glucose from reading to reading while the basal bolus method has been shown to provide superior control of blood glucose levels while also lowering the risk of hypoglycemia. Various SSI protocols are currently in use at our facility. Through the implementation of a standardized basal-bolus insulin order sheet we anticipate to curb the use of SSI in the non-critical inpatient population, ultimately providing optimal glucose control for our diabetic patients.

Methods: The basal-bolus order sheet has been developed with the input of the endocrinologist on staff and other multidisciplinary team members in order to ensure adequate insulin coverage as well as appropriate hypoglycemia measures. Basal insulin coverage is provided with insulin glargime and both the prandial and correction coverage is provided with insulin aspart. The order sheet provides pre-calculated weight-based basal and prandial bolus components. Three different correctional insulin scale intensities are available to order which are based upon factors such as patient weight, concurrent use of steroid therapy, as well as current home dose of insulin in order to obtain the best scale for each individual patient. The order sheet allows for individualization of therapy for each patient which sliding scale coverage doesn't currently allow. In addition to the implementation of the order sheet, providers will be educated on the importance of appropriate blood glucose control and how the basal-bolus approach can help to achieve that goal. Nursing in-services will be conducted on units that will utilize the order sheet in order to ensure that nursing staff understands all components of the order sheet. The order sheet will be available to use for all adult non-critical diabetic medical patients.

Results/Conclusions: Will be presented at Great Lakes Pharmacy Residency Conference

Learning Objectives:
Define the current management of patients with heart failure who have multiple hospital readmissions.
Identify modifiable factors that contribute to multiple readmissions among patients with heart failure.

Self Assessment Questions:
Which of the following medications are recommended by the most recently revised guidelines by the American College of Cardiology (ACC)/American Heart Association (AHA) for routine administration to patients?
A: Angiotensin Converting Enzyme Inhibitor
B: Angiotensin Receptor Blocker
C: Aldosterone Antagonist
D: Hydralazine/Isosorbide

Which of the following factors can influence glucose levels of hospitalized patients?
A: fasting <180 mg/dL; random <200 mg/dL
B: fasting <140 mg/dL; random <180 mg/dL
C: fasting <120 mg/dL; random <160 mg/dL
D: fasting and random <180 mg/dL

What are the recommended blood glucose ranges for the non-critical inpatient population?
A: fasting <180 mg/dL; random <200 mg/dL
B: fasting <140 mg/dL; random <180 mg/dL
C: fasting <120 mg/dL; random <160 mg/dL
D: fasting and random <180 mg/dL

Q1 Answer: A Q2 Answer: B
Q1 Answer: D Q2 Answer: B

ACPE Universal Activity Number 121-999-11-081-L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
SICKLE CELL PAIN CRISIS

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Purpose:
There are approximately 200,000 visits to the Emergency Department (ED) annually due to sickle cell disease (SCD), with more than 150,000 of these for sickle cell pain crisis (SCPC). Rehydration and pain management are the mainstays of treatment. Pruritis is a common side effect of opioid therapy and can be treated with antihistamines. Antihistamine use may result in sedation, potentially increasing the ED length of stay and rates of hospital admission. The primary outcome of this study is the characterization of antihistamine usage in subjects with SCPC at the University of Illinois Medical Center (UIMC) ED. Secondary outcomes include ED hospital admission, length of stay in the ED, return to the ED within seven days for SCPC and patient response to analgesia.

Methods:
A retrospective chart review was performed on 185 ED visits for SCPC in the UIMC ED between January 1 and August 31, 2010. Subjects were identified using ICD-9 codes for SCD.

Results:
A total of 112 ED visits were included for data analysis. Overall, 50% of SCPC encounters treated with opioids received antihistamines. There was one case of pruritis in a subject that was not treated with an antihistamine. Antihistamine treatment was associated with a mean duration of stay in the ED of 359 minutes, compared to 270 minutes for subjects who received only opioids (p=0.034). There were no statistically significant differences for rates of hospital admission, return to the ED within seven days for SCPC or response to analgesia between the study groups.

Conclusion:
Opioid-associated pruritis was uncommon within this subject population. Treatment with antihistamine medications was associated with increased length of stay, but was not statistically significant for rates of hospital admission, return to the ED with SCPC within seven days or response to analgesia. Routine use of antihistamine medications may not be required when treating patients with SCPC.

Learning Objectives:
Discuss the rationale for using antihistamine medications in patients treated for sickle-cell pain crisis.

Describe the use of antihistamine medications in patients with sickle-cell pain crisis in the University of Illinois Medical Center Emergency Department.

Self Assessment Questions:
Antihistamines are used during treatment of sickle cell pain crisis:
A: To treat pain
B: To treat or prevent opioid-associated pruritis
C: To prevent opioid-associated sedation
D: For rehydration therapy

Antihistamine therapy was associated with:
A: Increased duration of stay in the Emergency Department
B: Decreased admission to the hospital
C: Decreased rates of return to the Emergency Department within seven days
D: Decreased patient response to analgesics

Q1 Answer: B  Q2 Answer: A

ACPE Universal Activity Number 121-999-11-236 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
OPTIMAL HEART FAILURE MANAGEMENT IN THE OUTPATIENT SETTING
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Purpose: Heart failure (HF) is an increasingly prevalent, chronic disease that affects an estimated 5,800,000 Americans. The American College of Cardiologists (ACC) and American Heart Association (AHA) task force on practice guidelines have set recommendations for appropriate medications and their target doses. The ACC/AHA guidelines are designed to help optimize heart failure medications and their target doses. These guidelines recommend pharmacotherapy with an angiotensin converting enzyme inhibitor (ACE) or angiotensin receptor blocker (ARB), beta blocker (BB), aldosterone antagonist (AA), and diuretics. Various provider types exist for the outpatient treatment of heart failure, including heart failure specialty teams, cardiologists, and primary care physicians. It is important for heart failure medications to be dosed and titrated appropriately. However, it has not been demonstrated thus far which type of outpatient provider best optimally manages heart failure medications and their doses. The objectives of this study are to: 1) determine if HF patients are on appropriate evidence-based medications at optimal doses, and 2) note the differences in prescribing practices between heart failure, cardiology, and primary care physicians. "Optimal" drug therapy will be defined as meeting the target doses of evidence-based medications per the ACC/AHA heart failure guidelines.

Methodology: A retrospective data review will be performed on MetroHealth Medical Center (MHMC) adult patients with an ejection fraction less than 40% and diagnosis of HF, who have been seen by a single provider at least twice within the last year. Data collection will be conducted through MHMCs electronic medical records system, EPIC, between July 2009 and June 2010. The primary endpoints are: 1) percent of patients prescribed an ACE, ARB, BB, or AA, 2) percent of patients at 50% of the medications target doses, 3) percent of patients at target doses of a combination of either an ACE or ARB and BB, and 4) prescribing practices by department.

Results and Conclusions: To be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
State the recommended drug therapy for systolic heart failure according to ACC/AHA guidelines.
Identify which drug classes have been proven to decrease mortality and morbidity.

Self Assessment Questions:
Which of the following medication combinations are indicated in systolic heart failure regardless of NYHA functional class?
A AA plus BB
B: ACE-I plus BB
C: AA plus ARB
D: Digoxin plus ACE-I

According to the ACC/AHA guidelines, which of the following medication classes has been shown to both decrease mortality AND decrease hospitalizations?
A: AA, diuretics, BB
B: Digoxin, ACE-I, BB
C: Diuretics, digoxin, AA
D: AA, ARB, BB

Q1 Answer: B Q2 Answer: D

ACPE Universal Activity Number 121-999-11-250-L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

ASSESSMENT OF SECOND-GENERATION ANTIPSYCHOTIC POLYPHARMACY IN PATIENTS WITH SCHIZOPHRENIA AND SCHIZOPHRENIA-SPECTRUM DISORDERS IN AN OUTPATIENT MENTAL HEALTH CLINIC
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Background/Purpose: Polypharmacy in the forms of combinations of second-generation antipsychotics, combinations of first and second-generation antipsychotics, and aggressive dosing regimens have been increasingly used to treat schizophrenia spectrum disorders in clinical psychiatry. Although there is a small amount of supportive evidence, these practices are typically outside the scope of clinical practice guidelines and FDA prescribing guidelines. Possible problems associated with these regimens are increased risk for adverse effects associated with antipsychotics, drug interactions, and decreased patient compliance. The purpose of this study is to assess the prevalence of and prescriber documentation of rationale for antipsychotic polypharmacy in patients with schizophrenia spectrum disorders who are seen in an outpatient mental health clinic.

Methods: The study will be carried out via a retrospective, electronic chart review of patients who are seen by Gallahue Mental Health Services. Included patients will be 18 years or older with a diagnosis of schizophrenia, schizo-affective disorder, or psychotic disorder. Polypharmacy will be defined as the following: use of more than one second-generation antipsychotic, use of a second-generation antipsychotic and a first generation antipsychotic, use of medications to combat side effects of antipsychotics, and doses of antipsychotics outside FDA indicated guidelines. Data collected will include the following: patient diagnosis, sex, and age; names and doses of antipsychotics used; type of polypharmacy present; presence of prescriber documentation of rationale for polypharmacy; adverse drug reactions; and patient compliance. The primary endpoints evaluated will be the prevalence of polypharmacy, the type of polypharmacy present, doses of antipsychotics, and prescriber documentation of rationale for polypharmacy. Secondary endpoints will include patient adherence to regimen based on patient report and prescriber documentation, and adverse drug reactions.

Results/Conclusions: Data collection is ongoing. Data will be analyzed and results will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
List the common forms of antipsychotic polypharmacy seen in patients being treated for schizophrenia spectrum disorders.
Discuss possible problems associated with the use of antipsychotic polypharmacy regimens.

Self Assessment Questions:
Which of the following is associated with medication regimens containing more than one antipsychotic?
A Decreased patient compliance with regimen
B: Increased risk of drug interactions
C: Increased risk of adverse events
D: All of the above

Which of the following would be considered an inappropriate regimen as first-line treatment for schizophrenia?
A ziprasidone 20 mg BID
B aripiprazole 10 mg daily plus risperidone 1 mg BID
C paliperdone 6 mg daily
D olanzapine 5 mg daily

Q1 Answer: D Q2 Answer: B

ACPE Universal Activity Number 121-999-11-199-L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
EVALUATION OF THE EFFECT OF SINGLE DOSE ETomidate on MORTALITY in PATIENTS with TRAUMATIC INJURY

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Background
Etomidate is a non-barbiturate, hypnotic drug commonly utilized for rapid sequence intubation. It has limited effects on hemodynamic properties; however, it has been shown to decrease cortisol production after administration. Several authors have called for limiting the use of etomidate in critically ill patients due to its negative effect on cortisol. There is limited data available for etomidate effect on outcomes when used in patients with traumatic injury.

Purpose
To determine if there is an association between etomidate and clinical outcomes among patients with a traumatic injury.

Methods
This is an Institutional Review Board approved retrospective chart review of patients admitted to Akron General Medical Center (AGMC) between January 2006 and October 2010 with intubation after a traumatic injury. Patients were identified via the AGMC trauma registry. Patients were included if they were 18 years of age or older and intubated after traumatic injury. Exclusion criteria included: elective intubation, intubation greater than 24 hours after admission, more than one dose of etomidate during hospital admission, or a transfer to an outside hospital. Data collection included demographics, emergency department vital signs, injury severity score, intubation information, vasopressor usage, corticosteroid usage, and hospital discharge disposition. Patients were divided into three groups for analysis: patients receiving etomidate for intubation, patients receiving non-etomidate induction medications for intubation, or patients receiving no induction medication for intubation. The primary endpoint was the incidence of mortality during hospitalization following intubation after traumatic injury. Secondary endpoints included intensive care unit length of stay, hospital length of stay, length of time on ventilator, length of time on vasopressors, incidence of corticosteroid usage, and cosyntropin stimulation test results.

Learning Objectives:
Describe the results of previous studies regarding etomidate use in patients with traumatic injury.
Name the major side effects of etomidate.

Self Assessment Questions:
Which of the following has been shown in previous studies of trauma patients?
A: Etomidate has no effect on adrenal function.
B: Etomidate has no effect on length on ventilator.
C: Etomidate was found to prolong ICU and hospital length of stay in
D: Etomidate was found to prolong ICU and hospital length of stay in

Which of the following is a major side effect of etomidate?
A: Acute renal failure
B: Acute respiratory failure
C: Adrenal suppression
D: Hepatotoxicity
Q1 Answer: C Q2 Answer: C

ACPE Universal Activity Number 121-999-11-059-L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

USAGE OF GASTROINTESTINAL PROPHYLAXIS IN PATIENTS RECEIVING CLOPIDOGREL FOR ACUTE CORONARY SYNDROMES AND/OR PERCUTANEOUS CORONARY INTERVENTION IN RESPONSE TO FDA COMMUNICATIONS

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Purpose:
Guidelines recommend gastrointestinal (GI) prophylaxis such as proton pump inhibitors (PPIs) in patients receiving clopidogrel who are also at a high risk of upper GI bleeding. There is growing yet controversial concern that PPIs may decrease the effectiveness of clopidogrel and increase the risk of adverse cardiovascular events. The FDA released two communications in January and November of 2009 concerning the potential PPI-clopidogrel interaction. The November 2009 FDA communication specifically warned healthcare professionals against the use of omeprazole with clopidogrel. The purpose of this study is to characterize the choice of GI prophylaxis used in patients at Jesse Brown VA Medical Center receiving clopidogrel for ACS and/or PCI before and after the FDA communications.

Methods:
This study will be a retrospective, electronic chart review of patients with an approved clopidogrel consult for 12 months or longer during one of two enrollment periods: January 25, 2007 - January 25, 2008 and July 15, 2009 - April 15, 2010. The electronic charts of patients in the first enrollment period will be reviewed for 12 months with the exception of those approved for indefinite clopidogrel therapy on omeprazole. Those charts will be reviewed again on October 15, 2010 for type of active GI prophylaxis. The charts of patients enrolled in the second enrollment period will be reviewed for up to one year or until October 15, 2010.

Criteria for exclusion include approved clopidogrel consults for less than 12 months and/or non-cardiac clopidogrel approvals. The primary endpoints will be the percent (%) change in the choice of GI prophylaxis and PPIs used between the two enrollment groups and the % change in the choice of GI prophylaxis and PPIs used within the second enrollment group before and after the November 2009 FDA communication.

Results/Conclusion:
To be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Discuss the current literature regarding the potential drug interaction between clopidogrel and PPIs.
Identify patients on clopidogrel who are at high risk of GI bleeding.

Self Assessment Questions:
Which of the following is true regarding current literature on the potential drug-drug interaction between clopidogrel and PPIs?
A: Current literature findings have confirmed the proposed drug interaction.
B: The concern that PPIs may reduce the effectiveness of clopidogrel.
C: Most published studies on the potential drug-drug interaction between clopidogrel and PPIs used the two enrollment groups and the % change in the choice of GI prophylaxis and PPIs used within the second enrollment group before and after the November 2009 FDA communication.

Which of the following increases a patient's risk for GI bleeding while receiving clopidogrel?
A: Age 40 years or younger
B: Concurrent anticoagulant use
C: Topical corticosteroid use
D: Distant history of NSAID use
Q1 Answer: B Q2 Answer: B

ACPE Universal Activity Number 121-999-11-367-L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
RESOURCE UTILIZATION BEFORE AND AFTER IMPLEMENTATION OF REAL-TIME PCR ON STool SAMPLES FROM PATIENTS SUSPECTED OF INFECTION WITH CLOSTRIDIUM DIFFICILE.

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Recently, a new method to detect Clostridium difficile using real-time PCR was approved by the FDA. It has been proven to be more sensitive and specific, with a decreased turn-around time. The objective of this IRB-approved, retrospective observational study is to evaluate patient management practices and resource utilization before and after implementation of real-time PCR testing using the BD GeneOhm Cdiff Assay for the detection of Clostridium difficile infection (CDI) in hospitalized patients at Wishard Health Services (WHS). It is hypothesized that the use of the PCR will result in more rapid treatment initiation, with reduced utilization of contact isolation and antibiotic usage in relation to CDI treatment.

Adult patients with diarrhea tested for Clostridium difficile by EIA or PCR between December 16, 2009 and December 16, 2010 were included in the study (100 in each group). Patients were included in the analysis if they had been hospitalized for at least 48 hours before testing of unformed stool samples for CDI. Outpatients, prisoners, and children were excluded from the analysis. The medical record of each patient was reviewed for collection of demographic data, hospital stay data, and infection-specific data using a standardized data collection form. A comparison of the time to final test reporting and number of stool tests ordered per hospital stay was performed for each test (EIA versus PCR).

As expected, the average days and costs of unnecessary antibiotic usage, appropriate isolation use, and prolonged hospitalization was decreased with the use of the PCR. In addition, the average days and costs of unnecessary antibiotic usage, isolation use, and prolonged hospitalization was decreased with the use of the PCR. The clinical management practices and resource utilization before and after implementation of real-time PCR testing using the BD GeneOhm Cdiff Assay for the detection of Clostridium difficile infection (CDI) in hospitalized patients at Wishard Health Services (WHS). It is hypothesized that the use of the PCR will result in more rapid treatment initiation, with reduced utilization of contact isolation and antibiotic usage in relation to CDI treatment.

SELF ASSESSMENT QUESTIONS:

Compared to EIA for the diagnosis of CDI, the PCR is more:
A sensitive
B specific
C Only A
D A and B

Based on the results of this study, the use of the PCR for detection of Clostridium difficile infection may improve patient care and decrease overall resource utilization.

MALIGNANCY IS ASSOCIATED WITH INCREASED ANTICOAGULATION INSTABILITY AND MORE INTENSIVE ANTICOAGULATION MANAGEMENT

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BACKGROUND/PURPOSE: Cancer patients who require concomitant anticoagulation may experience anticoagulation instability related to consequences of their malignancy or its treatment; for example, diet fluctuations and drug interactions. Although emerging evidence indicates that patients with cancer have higher TTR and lower INR variability compared to patients without cancer, the amount of anticoagulation management required and its clinical impact remain uncertain. Therefore, we sought to quantify anticoagulation instability in malignancy and determine the amount of clinic management required.

METHODS: Our Institutional Review Board-approved retrospective chart review, examined medical records of 40 patients at our pharmacist-managed anticoagulation clinic. We included patients with cancer who were on anticoagulation and had at least one INR in the target range. We matched cancer patients to clinic patients without malignancy according to gender, ethnicity, and age. To quantify anticoagulation instability, we calculated (1) INR standard deviation, (2) total time in therapeutic range (TTR), and (3) proportion of visits for which INR was within target range, <2.0, and >3.0. To assess anticoagulation management, we determined the proportion of weekly dosage changes and transient dose adjustments required to maintain therapeutic anticoagulation.

RESULTS: Patients were predominantly male (60%) and white (70%); age 51 years, follow-up time 731120 days. Cancer patients were unstable; indicated by higher INR standard deviations (1.20.14 vs. 0.52.02; P=0.0002), lower TTR (485 vs. 802%; P<0.0001), fewer INRs within target range (483 vs. 742%; P=0.0001), and more INRs <2.0 (343 vs. 142%; P<0.0001) and >3.0 (203 vs. 112%; P=0.012). Cancer patients required a greater proportion of dose adjustments (72 vs. 21%; P=0.026), and double the amount of dose changes (433 vs. 202%; P<0.0001). There was also a 10-fold increase in combined adverse event frequency in patients with cancer (6.0.17 vs. 0.60.3%; P=0.0039).

CONCLUSION: Malignancy was associated with increases in anticoagulation instability and increases in adverse events. Consequently, cancer patients required more intensive management.

SELF ASSESSMENT QUESTIONS:

What potential factor(s) can lead to anticoagulation instability in cancer patients?
A Drug-drug interactions between chemotherapy and warfarin
B Nausea and vomiting associated with cancer treatments
C Diet fluctuation related to consequences of cancer treatments
D All of the above

Which of the following statement is correct?
A Patients with malignancy spend more time in target INR range
B Patients with malignancy require more intensive anticoagulation management
C The presence of malignancy resulted in increased TTR versus controls
D Patients with malignancy have a 10-fold decrease in adverse events

Q1 Answer: D Q2 Answer: B

ACPE Universal Activity Number 121-999-11-119 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
EVALUATION OF COMBINATION THERAPY IN PULMONARY ARTERIAL HYPERTENSION

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PURPOSE. Pulmonary arterial hypertension (PAH) is a debilitating disease that results in right ventricular dysfunction, impairment of activity, and may lead to right heart failure and death. The pathogenesis of pulmonary hypertension is thought to involve both genetic and environmental factors. Changes in vasoactive mediators lead to alterations in vascular tone and increase vascular remodeling. Current treatment options target these vasoactive mediators, including endothelin receptor antagonists, phosphodiesterase inhibitors, and prostacyclin analogs. As a result of the multimechanistic pathophysiology of PAH, combination therapy has emerged as a potential treatment option. Current literature is minimal regarding the efficacy of combination therapy for PAH. With limited data regarding the safety, efficacy, and cost associated with combination therapy, more research is necessary to identify the optimal regimen for treatment of pulmonary arterial hypertension.

METHODS. The current study is a retrospective, single-center, cohort study evaluating the utility of combination therapy for PAH in patients treated at the pulmonary hypertension clinic at University Hospital in Cincinnati, OH. Patients prescribed a second agent for pulmonary hypertension or simultaneously initiated on at least two agents for pulmonary arterial hypertension will be included in the study. Patients will be followed for two years or until death for data collection.

The primary outcome of this study is to determine the change in the six minute walk test for patients once combination therapy is initiated. Secondary outcomes are to identify echocardiogram changes, incidence of adverse effects and clinical worsening while on combination therapy.

RESULTS. Data collection ongoing. For 80% power, to detect a change of 20 meters in the six minute walk test after six months of combination therapy, enrollment of 40-150 patients will be necessary.

CONCLUSIONS. Pending data review and analysis.

Learning Objectives:
Discuss the pathophysiology of PAH and determine appropriate treatment options.
Explain the role of combination therapy in the management of patients with PAH.

Self Assessment Questions:
The only agent shown in clinical trials to improve survival in idiopathic pulmonary arterial hypertension is:

A Treprostinil
B Epoprostenol
C Bosentan
D Sildenafil

The five year survival rate of idiopathic pulmonary arterial hypertension is approximately:

A 10%
B 30%
C 50%
D 70%

Q1 Answer: B Q2 Answer: C

IMPLEMENTATION OF A COMPUTERIZED POINT OF ORDER ENTRY ANTIMICROBIAL MENU AND IMPACT ON PROVIDER SATISFACTION

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Objective: The primary objective of this study is to assess provider prescribing behavior pre and post implementation of an antimicrobial menu within the Computerized Patient Record System (CPRS). This project is intended to enhance antimicrobial stewardship by aiding providers in making antimicrobial choices that follow nationally recognized guidelines, comply with the hospitals antimicrobial restrictions and are potentially cost effective.

Methodology: A survey will be distributed before the computerized antimicrobial menu is implemented. The pre-survey will measure the frequency providers prescribe antimicrobials, the resources providers are using to aid in antimicrobial choices and the difficulty of prescribing antimicrobials currently at the Clement J. Zablocki Veterans Affairs Medical Center. Published guidelines, studies and infectious disease providers will review and set standards for optimal treatments to be included in the antimicrobial menu. Promotion and education of the antimicrobial menu will then be presented to providers who prescribe antimicrobials at the Clement J. Zablocki Veterans Affairs Medical Center. A follow up survey will be distributed to providers one month after implementation of the antimicrobial menu to assess influences on prescribing behavior. Statistical design will be measuring certain survey responses in percentages and comparing averages per provider.

Results: Results and conclusions to be presented at the Great Lakes Residency Conference.

Learning Objectives:
Identify different methods for antimicrobial stewardship.
Discuss outcomes associated with antimicrobial decision support systems.

Self Assessment Questions:
Antimicrobial resistance in hospitals
A Is on a downward trend
B Continues to rise
C Has stayed the same
D Is a problem that can be ignored

Antimicrobial Decision support systems
A Increase mortality
B Lengthen hospital stay
C Decrease cost
D Increase antimicrobial use
Q1 Answer: B Q2 Answer: C

ACPE Universal Activity Number 121-999-11-307 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
ASSESSING THE IMPACT OF PHARMACY REVIEW ON AMIODARONE MONITORING IN A VA OUTPATIENT SETTING
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PURPOSE: Amiodarone is an antiarrhythmic medication that has a high risk of toxicity associated with its use and requires close monitoring. The purpose of this study is to assess provider acceptance of pharmacist recommendations pertaining to amiodarone monitoring at the Battle Creek VA Medical Center. The primary goal of this study is to increase provider adherence to recommended amiodarone monitoring parameters, which will minimize the risk of negative outcomes associated with the use of this medication.

METHODS: Data will be collected retrospectively from October 15, 2011 to May 15, 2011. All patients who are receiving amiodarone on an outpatient basis and have been receiving the medication for at least six months prior to the initiation of the study will be included. Each study patient will receive a chart review to determine if appropriate monitoring, defined as a thyroid stimulating hormone level every six months, hepatic panel every six months, electrocardiogram every six months, and chest x-ray every twelve months, is occurring. If appropriate monitoring is not found to be occurring, an intervention will be made via a chart note to the appropriate provider. Each patient requiring an intervention will receive a second chart review in four weeks to assess provider acceptance of recommendations. The number of interventions made and accepted will be tracked. The results will be compared with a medication-use evaluation performed by the Pharmacy Service in March 2010 looking at provider adherence to recommended amiodarone monitoring parameters.

PRELIMINARY RESULTS: A total of 158 patients were analyzed and of these 113 met criteria to be included in the study. Of the patients included in the study, 64 have received a second review thus far.

CONCLUSIONS: Data analysis is ongoing and comprehensive results and conclusions will be presented at the Great Lakes pharmacy resident conference.

Learning Objectives:
Discuss provider acceptance of pharmacist recommendations pertaining to amiodarone monitoring in a VA outpatient setting.
Identify if pharmacy review increases provider adherence of recommended amiodarone monitoring parameters.

Self Assessment Questions:
Which of the following recommended amiodarone monitoring parameters should be completed every twelve months?
A: Thyroid stimulating hormone level
B: Hepatic function panel
C: Electrocardiogram
D: Chest x-ray

Which of the following is the goal of increasing provider adherence to recommended amiodarone monitoring parameters?
A: Increase the risk of negative outcomes associated with amiodarone
B: Minimize the risk of negative outcomes associated with amiodarone
C: Increase the number of patients who receive amiodarone
D: Decrease the number of patients who receive amiodarone

Q1 Answer: D  Q2 Answer: B

ACPE Universal Activity Number 121-999-11-255 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5

HEALTH LITERACY IN VA DIABETES POPULATION
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PURPOSE: Health literacy is defined as the degree to which individuals are capable of attaining and processing basic health information, as well as the ability to make appropriate health decisions. Studies have shown low health literacy is associated with poorer health status, a higher frequency of severe hypoglycemia, increased hospitalizations and mortality, and higher health care costs. The purpose of this study is to determine if retrospective endpoints such as hemoglobin A1c, retinopathy, nephropathy, blood pressure, lipids, hospitalizations or emergency department visits, and severe hypoglycemic episodes in the past year correlate with the current level of health literacy in VA patients with diabetes.

METHODS: Patients with Type 2 diabetes will be invited to participate in the study while attending an appointment in a pharmacy-managed ambulatory care clinic. Potential subjects will be pre-screened based on exclusion criteria prior to obtaining informed consent. The pharmacist provider will administer a survey which includes a single question validated to assess level of health literacy. Based on the patients response, he or she will be classified as having adequate, marginal, or inadequate health literacy. In addition, patients will be asked questions to determine other factors that may have an impact on level of health literacy and health outcomes. Diabetes-related endpoints will be retrospectively collected using the most recent documented values in the medical record. Results will be adjusted for confounding variables.

RESULTS/CONCLUSION: The results and conclusion are pending.

Learning Objectives:
Recognize the prevalence of low health literacy in the United States.
Identify characteristics of individual patients who are more likely to have low health literacy, and who may benefit from further clinical instruction regarding medication therapy management of diabetes.

Self Assessment Questions:
What percent of American adults have been shown to have low health literacy?
A: 5%
B: 11%
C: 17%
D: 33%

Low health literacy is more commonly seen in:
A: Patients using five or more medications
B: Patients without chronic disease
C: Racial and ethnic minorities
D: Well-educated individuals

Q1 Answer: D  Q2 Answer: C

ACPE Universal Activity Number 121-999-11-325 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
PURPOSE:
Inappropriate use of antibiotics leads to undesirable outcomes including resistance, medication toxicities, drug-drug interactions, superinfections (i.e. Clostridium difficile colitis) and other health care related infections. These may lead to an increase in morbidity, health care costs, and mortality. Many professional societies have recommended implementing antimicrobial stewardship programs to improve antibiotic utilization. Implementation of these programs has become an integral strategy to increase patient safety through optimal treatment of infections. The purpose of this study is to evaluate the effectiveness of the Antimicrobial Stewardship Program that was implemented on June 1, 2010 at the Cincinnati VA Medical Center, as well as help identify areas of improvement for the optimal use of antimicrobials.

METHODS:
This is a single-center, retrospective, quality improvement study to compare patient outcomes prior to and after implementation of the Antimicrobial Stewardship Program. Patients who received at least one dose of intravenous antimicrobial therapy admitted to the Cincinnati VA Medical Center between June 1st, 2009 through September 30th, 2009 and June 1st, 2010 through September 30th, 2010 will be evaluated for inclusion. The primary outcome is the mean days of therapy per antibiotic. Secondary outcomes include the total days of therapy (DOT) per 1000 hospitalized patient days, defined daily dose (DDD) per 1000 hospitalized patient days as defined by the World Health Organization, mean days of therapy per patient, mean days of therapy for each infection, appropriateness and adequacy of therapy, number of recommendations made and accepted, number of Clostridium difficile infections, hospital length of stay, antimicrobial cost and in hospital mortality.

RESULTS/CONCLUSIONS:
Data collection and analysis are currently being conducted.

Learning Objectives:
Discuss the goals of an Antimicrobial Stewardship Program and the impact on patient outcomes.
Review the components of the Infectious Diseases Society of America (IDSA) and the Society for Healthcare Epidemiology of America (SHEA) guidelines for the development of an antimicrobial stewardship program.

Self Assessment Questions:
What is a complication of improper antimicrobial use?
A: Myocardial infarction
B: Antimicrobial resistance
C: Deep vein thrombosis
D: Atrial fibrillation

According to IDSA/SHEA guidelines, what is one of the proactive core strategies for the foundation of an antimicrobial stewardship program?
A: Antimicrobial cycling
B: Parenteral to oral conversion
C: Dose optimization
D: Prospective audit with intervention and feedback

Q1 Answer: B   Q2 Answer: D

ACPE Universal Activity Number 121-999-11-129 -L01-P
Activity Type: Knowledge-based   Contact Hours: 0.5
EVALUATION OF ANTIBIOTIC CHOICE AND TREATMENT DURATION FOR URINARY TRACT INFECTIONS AT A COMMUNITY HOSPITAL
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Background:
Urinary tract infections (UTIs) are the most commonly occurring bacterial infections in humans, accounting for a large annual percentage of Emergency Department (ED) visits and hospitalizations. The most common UTI pathogens nationally include: Escherichia coli, Staphylococcus saprophyticus, Proteus mirabilis, Enterococcus faecalis Enterobacter spp, Serratia spp, Staphylococcus aureus and Pseudomonas aeruginosa. The most recent Infectious Disease Society of America (IDSA) guidelines for UTI treatment identified short course, 3 days antibiotic therapy to be equally efficacious as conventional, 7-14 day therapy. There is documented growing resistance to commonly prescribed antibiotic regimens for UTI treatment, including fluoroquinolones.

Purpose:
Evaluate the antibiotic choice and treatment duration in patients with the diagnosis of UTI who are admitted to the hospital.

Methods:
This is a retrospective chart review of patients evaluated at St. Elizabeth Regional Health (SERH) who are greater than 16 years old, with an ICD-9 code of 599.0 or 791.9 (identifying UTI or pyuria) and antibiotic orders for treatment of UTI. An evidence based order set (EPOS) will be introduced and education provided to the Hospitalist team regarding UTI treatment guidelines and an update on growing local antibiotic resistance patterns of common UTI pathogens to treatments currently being utilized. A prospective chart review will be performed after staff education is complete to evaluate the impact of education efforts and the EPOS on antibiotic choice and treatment duration.

Results:
Results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Recognize the most common UTI pathogens.
Describe the appropriate empiric antibiotic choice and treatment duration for an uncomplicated UTI.

Self Assessment Questions:
Which of the following is not a common UTI pathogen?
A: Staphylococcus saprophyticus
B: Proteus mirabilis
C: Escherichia coli
D: Haemophilus influenzae

What is the most appropriate empiric treatment duration for an uncomplicated UTI?
A: 1 day of IV antibiotic therapy
B: 3 days of IV antibiotic therapy
C: 7 days of IV antibiotic therapy
D: 14 days of IV antibiotic therapy

Q1 Answer: D Q2 Answer: B

PROSPECTIVE COMPARISON OF CEFEPIME PHARMACOKINETICS IN CRITICALLY ILL TRAUMA AND MEDICAL PATIENTS WITH SUSPECTED VENTILATOR-ASSOCIATED PNEUMONIA: THE CONCENTRATION STUDY
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BACKGROUND:
Multi-drug resistant (MDR) Gram-negative pathogens are associated with significant morbidity and mortality in critically ill patients. Prompt initiation of appropriately dosed, adequate empiric antibiotic therapy is imperative in patients with suspected/confirmed infection. Pharmacokinetic changes in critical illness may impair the ability of usual dosage regimens to achieve optimal pharmacodynamic targets. While it is known that pharmacokinetics vary between specific subpopulations of critically ill patients, including multiple trauma and medical patients, specific pharmacokinetic differences for cefepime, a commonly used broad-spectrum antibiotic, are poorly characterized. This study plans to measure and compare cefepime pharmacokinetics in critically ill medical and trauma patients.

METHODS:
This is a prospective, single center, clinical pharmacokinetic study. Adult critically ill multiple trauma and medical patients with suspected or confirmed ventilator-associated pneumonia (VAP) and normal renal function receiving cefepime will be included. Patients will receive cefepime 2 grams intravenously infused over 6 hours every 12 hours, consistent with local standards of care. Unbound cefepime serum concentrations will be assessed after the third dose at 6 specific time points and measured using reverse-phase high-performance liquid chromatography (HPLC). Pharmacokinetic parameters from compartmental and noncompartmental analyses will be determined for all patients. These parameters will secondarily be compared between critically ill trauma and medical patients. A total of 12 patients (6 in each group) will be enrolled.

RESULTS AND CONCLUSIONS:
Data collection and analysis are currently being conducted.

Learning Objectives:
Describe pharmacodynamic targets and supportive clinical evidence for lactam antibiotics.
Identify pharmacokinetic changes in the critically ill and discuss implications on ability to achieve pharmacodynamic endpoints.

Self Assessment Questions:
Which of the following pharmacokinetic parameters may be altered in critically ill patients, including multiple trauma and medical patients, specific pharmacokinetic differences for cefepime, a commonly used broad-spectrum antibiotic, are poorly characterized. This study plans to measure and compare cefepime pharmacokinetics in critically ill medica

A: Volume of distribution
B: Clearance
C: Protein binding
D: All of the above

Q1 Answer: C Q2 Answer: D

ACPE Universal Activity Number 121-999-11-136 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
CLINICAL IMPACT OF A PHARMACIST-DIRECTED SEDATION PROTOCOL IN A MEDICAL INTENSIVE CARE UNIT

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Purpose: Critically ill patients often require the use of continuous sedation and analgesia medications. The 2002 clinical practice guidelines for the use of sedation and analgesia in the intensive care unit (ICU) recommend a protocol, guideline, or algorithm to titrate sedative and analgesic therapy to predefined goals. Previous studies have shown that implementation of a sedation protocol with pharmacist involvement improves patient outcomes and compliance with a sedation protocol. Northwestern Memorial Hospital currently has dosing and titration guidelines for sedative medications in all intensive care units. The primary objective of this study is to evaluate compliance with a pharmacist-driven sedation protocol in the medical intensive care unit (MICU). Length of ICU and hospital stay, duration of mechanical ventilation, and pharmacist interventions will be evaluated as secondary objectives.

Methodology: This is a retrospective cohort study designed to look at the clinical outcomes of a pharmacist-driven sedation protocol in the MICU. Patients will be included in the study if they have been admitted to the MICU and have been initiated on sedative agents. Patients will be excluded if they are not mechanically ventilated or if they are ≤ 18 years of age. A retrospective review of the use of sedative medications prior to implementation of the sedation protocol and pharmacist interventions will be compared to the use of sedative medications according to the current sedation protocol coordinated by pharmacists and pharmacist interventions. These interventions will be categorized as discontinuation of sedation, initiation of alternative agents, interchange of bolus therapy instead of continuous infusion, decrease in rates/doses of sedative agents, and initiation of the sedation protocol. Data for baseline and outcome variables will be collected and used to determine compliance with the protocol, impact on clinical outcomes, and evaluation of pharmacist interventions.

Results/Conclusion: Research results and conclusions will be presented at the conference.

Learning Objectives:
Discuss the benefits of minimizing sedation in intensive care units.
Explain the impact of a pharmacist on adherence to a sedation protocol, length of stay in the ICU, and length of mechanical ventilation in a medical intensive care unit.

Self Assessment Questions:
Most patients in the ICU should be sedated to a target RASS score of:
A RASS score of -3 to -5 is appropriate for most patient in the ICU
B A RASS score of -2 to 0 is appropriate for most patients in the ICU
C A target RASS score is not needed for patients being sedated in the ICU
D RASS scoring does not evaluate a patient's current sedation level.

Outcomes associated with minimizing sedation to a target sedation range in critically ill patients include:
A Decreased length of mechanical ventilation and decreased hospital stay
B Increased length of mechanical ventilation and decreased hospital stay
C An increase in the rate of delirium in ICU patients
D Decreased length of mechanical ventilation and increased hospital stay

Q1 Answer: B Q2 Answer: A

EVALUATION OF A HEPARIN-INDUCED THROMBOCYTOPENIA (HIT) MANAGEMENT PROTOCOL

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Background/Purpose:
Heparin-induced Thrombocytopenia (HIT) is a potentially fatal immune-mediated adverse drug reaction. Our institution implemented a new HIT Recognition and Management Protocol in October of 2010. This protocol requires calculation of the 4Ts score (estimates clinical probability of having HIT) for patients with thrombocytopenia prior to ordering a heparin-platelet factor-4 (HPF4) enzyme immunoassay (EIA). Patients with a low suspicion for HIT should not be tested. HIT treatment should begin at the time of moderate-to-high HIT suspicion and EIA results should direct need for continuation of therapy. Positive EIA results will automatically have a reflex serotonin-release assay (SRA) sent to confirm the diagnosis of HIT. Prior to implementation of this protocol, data characterizing the practice of HIT were collected for a six-month period and will serve as the control group. The purpose of this study is to evaluate the impact of a new HIT Recognition and Management Protocol.

Methods:
This study retrospectively evaluated the post-implementation period of a Heparin-Induced Thrombocytopenia (HIT) Recognition and Management Protocol. Our institutional review board approved this study. Hospitalized patients receiving a direct thrombin inhibitor (DTI) for suspected HIT between November 2010 and March 2011 were included. The primary endpoint is the duration of inappropriate DTI therapy, defined as the use of a DTI in a patient with a low 4Ts score and/or the continuation of a DTI after a negative EIA or SRA result. Secondary endpoints include determining how often patients were managed according to the protocol, rate of major bleeding, quantification of costs associated with inappropriate DTI use, and the utility of reflex SRA testing. Data from the post-implementation period will be compared to the baseline treatment period where applicable.

Results:
This study is still under investigation. Results and conclusions will be presented at the Great Lakes Resident Conference.

Learning Objectives:
Describe the components of the 4Ts score and its use in determining the probability of HIT.
Outline the appropriate management sequence for a patient with HIT.

Self Assessment Questions:
Which of the following is a component of the 4Ts score?
A Laboratory Testing
B Thrombocytopenia
C Therapeutic Index
D Direct Thrombin Inhibitors

Which sequence best describes the management protocol of a patient with a 4Ts score of 4?
A Discontinue heparin, order an EIA and SRA, start a DTI and warfarin
B Order a SRA, start a DTI, start warfarin once platelets have recovered
C Discontinue heparin, order an EIA, start a DTI, start warfarin once an EIA is obtained
D Order an EIA, start a DTI, discontinue heparin once aPTTs are in the desired range

Q1 Answer: B Q2 Answer: C

Activity Type: Knowledge-based Contact Hours: 0.5

ACPE Universal Activity Number 121-999-11-153 -L01-P
EVALUATION OF MEDICATION RECONCILIATION ERROR RATE BEFORE AND AFTER NURSING EDUCATION IN A COMMUNITY HOSPITAL
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Purpose: To evaluate the impact of pharmacist led nursing education on admission medication reconciliation error rate.

Methods: This study was submitted and approved by the Central Baptist Hospital Institutional Review Board. New admissions to the medicine/cardiology were randomly selected for inclusion in the study. Patients admitted on no home medications were excluded. Patients will be identified for inclusion upon receiving the admission medication reconciliation form in pharmacy and from the previous 24 hour admission list. Medication histories will be reconciled by speaking with the patient/family/caregiver, verification of prescription bottles, contacting physicians office, and contacting the outpatient pharmacy as deemed necessary. Errors in the medication reconciliation process will be documented in the following categories: medication omission, medication addition, wrong strength/dose, wrong drug/dosage form, and wrong directions. After data has been collected on 50 patients, pharmacy will provide an in-service to the nurses on the medicine/cardiology nursing units based on the findings of the pre in-service data collection. The process of collecting medication reconciliation data will continue for 50 patients after nursing in-service. The medication reconciliation error rate will be calculated before and after in-service to assess the benefits of nursing education.

Preliminary Results: Fifty medication reconciliation forms were collected and reviewed for errors. Forty-two medication reconciliation forms collected by nursing initially contained at least 1 error. These results lead to an error rate of 84% (42/50). The total number of admit medications for the 50 patients combined was 534 medications. There were 174 medication errors with these 534 medications. This is a medication error rate of 32.58%. The majority of errors involved cardiac medication, inhalers, pain medications, and vitamins.

Learning Objectives:
List the common categories of medication errors.
Identify the most common medication classes involved in errors.

Self Assessment Questions:
Of the following, which medication error category had the most errors on initial data collection?
A: Medication omission
B: Wrong medication dose/strength
C: Wrong medication directions
D: Wrong medication name/dosage form

Of the following, which medication class had the most errors on initial data collection?
A: Cardiac medications
B: Inhalers
C: Pain Medications
D: Vitamins

Q1 Answer: B  Q2 Answer: A

ACPE Universal Activity Number 121-999-11-476 -L05-P
Activity Type: Knowledge-based  Contact Hours: 0.5

EVALUATION OF A COMMUNITY PHARMACY-BASED COMPREHENSIVE FOOT EXAMINATION PROGRAM FOR PATIENTS WITH DIABETES
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Purpose: The American Diabetes Association (ADA) published a position statement in 2008 summarizing recommendations of a comprehensive foot examination program for patients with diabetes. Community pharmacists are in a unique position to provide preventative foot care to patients with diabetes through screening, risk classification, and referral. No study to date has evaluated the implementation of a comprehensive foot examination program in a community pharmacy-based setting. The purpose of this project is to develop, implement, and evaluate a community pharmacy-based comprehensive foot examination program for patients with diabetes. The objectives are to provide a comprehensive foot exam to patients in a diabetes disease management program and to determine if a comprehensive foot exam performed by a pharmacist results in proper identification, risk categorization, and appropriate referral of at risk patients.

Methods: This project will be implemented in an existing diabetes disease management program offered by a large chain supermarket pharmacy. A foot exam protocol will be created based on current ADA recommendations. A training program will be provided to pharmacists to review the protocol and components of a comprehensive foot exam. Components will include assessment of patient history, physical assessment, proper use of a monofilament and tuning fork, and proper risk classification. Upon implementation, the percentage of patients in the diabetes program who receive a comprehensive foot exam will be tracked. The number of patients referred to physicians or podiatrists will be documented, and follow-up after referral will evaluate proper identification and appropriate referral of at risk patients. A diabetes foot product formulary will be developed, and the impact of the program on diabetes foot care product sales will be assessed.

Preliminary Results: The program is in the process of being implemented. Preliminary results will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Describe two inexpensive methods to evaluate loss of protective sensation in patients with diabetes.
Discuss the three major causal pathways of foot complications in diabetes.

Self Assessment Questions:
Which of the following is considered an inexpensive, simple, and efficacious tool for identifying loss of protective sensation?
A: CT angiogram
B: Monofilament
C: Neurometer
D: Biothesiometer

How does sensory neuropathy contribute to risk of foot complications in patients with diabetes?
A: It may cause muscle atrophy.
B: It may lead to skin cracking.
C: It may cause lack of oxygenation to a foot wound.
D: It may lead to unperceived trauma.

Q1 Answer: B  Q2 Answer: D

ACPE Universal Activity Number 121-999-11-228 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
RISK FACTORS ASSOCIATED WITH THROMBOCYTOPENIA IN THE INTENSIVE CARE UNIT POPULATION

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Purpose: Thrombocytopenia is commonly observed in critically ill patients and establishing a definitive cause may be difficult. Risk factors associated with this population include specific disease states, invasive catheters, and administration of multiple medications believed to cause thrombocytopenia. It is associated with prolonged hospital stays and overall worse outcomes for critically ill patients. The purpose of this study was to identify critically ill patients with thrombocytopenia defined as a platelet count of < 150,000 and evaluate common factors in this population that may contribute to this clinical finding.

Methods: This was a retrospective, medical record review of patients admitted to all adult ICUs at a 473-bed academic, tertiary-care medical center. Eligible patients included those with an ICU length of stay of at least 4 days and administration of one of the following medications: H2 - antagonists, proton pump inhibitors, vancomycin, linezolid, unfractionated heparin, and/or low-molecular weight heparin. Patients were excluded from the study if they were transplant recipients, cirrhotic, had known malignancy, had cardiothoracic surgery, were transferred from an outside hospital, and/or received platelet transfusion within 24 hours of admission. Patients were stratified into two categories based on the presence or absence of a diagnosis of thrombocytopenia. The primary objective of the study was to determine the relationship of various factors with the development of thrombocytopenia. Secondary objectives included determining the rate of thrombocytopenia and analyzing the cost-effectiveness of using agents with presumed lower thrombocytopenia risk. A multivariate analysis of disease states, medications, and severity of illness was performed to determine a relationship between the specified parameters and thrombocytopenia.

Results/Conclusion: Data collection is in progress. Results will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Identify the relationship of various factors with the development of thrombocytopenia.
Discuss the cost-effectiveness of using medications with presumed lower thrombocytopenia risk.

Self Assessment Questions:
Thrombocytopenia may be the result of:
A. Increased production of platelets
B. Decreased consumption of platelets
C. Decreased destruction of platelets
D. Abnormal sequestration of platelets

Thrombocytopenia is known to:
A. Increase mortality
B. Decrease mortality
C. Have no effect on mortality
D. Decrease hospital length of stay

Q1 Answer: D  Q2 Answer: A

TRANSITION FROM CONTINUOUS INTRAVENOUS INSULIN INFUSION TO SUBCUTANEOUS MULTIPLE DAILY INJECTIONS IN THE INTENSIVE CARE UNIT

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Purpose: No evidence based guidelines or consensus statements exist to help drive the transition from insulin infusion to subcutaneous multiple daily injections. The objective of the study is to evaluate the efficacy and safety of an insulin infusion transition guideline set forth by a health systems inpatient Diabetes Team.

Methods: This study has been approved by the Institutional Review Board. It is a retrospective chart analysis of patients admitted 1/01/2010 through 11/30/2010. The health systems electronic medical record system will be used to identify adults in an intensive care unit receiving an continuous intravenous insulin infusion for greater than or equal to 24 hours who are then transitioned to subcutaneous multiple daily insulin injections. Additionally, study subjects must receive one of the following diets for 24 hours post-transition: nothing by mouth, total parenteral nutrition, or continuous tube feeds. Patients admitted with diabetic ketoacidosis or hyperglycemic hyperosmolar syndrome will be excluded from the study. The intervention arm will consist of patients in whom the insulin transition guideline was followed: initiation of insulin glargine 0.1 to 0.3 units per kg (up to 0.5 units per kg if home dose) subcutaneously no later than the evening prior to transition plus every 6 hour regular insulin correctional scale with a base dose equal to 4 times the plateau insulin infusion rate. The patients in whom the above guideline was not followed will comprise the comparator arm. The primary outcome will be time, as measured in hours, within target plasma glucose range within the first 24 hours post insulin transition. Safety outcomes will include incidence of severe hypoglycemia, mild hypoglycemia, and severe hyperglycemia. Other secondary incomes include ICU and hospital, re-initiation of insulin infusion, and glycemic variability.

Results: To be presented

Conclusion: To be presented

Learning Objectives:
Explain the rationale for using insulin glargine to facilitate insulin infusion transition.
Describe how to calculate the insulin algorithm dose for transitioning to subcutaneous multiple daily injections.

Self Assessment Questions:
Which of the following best describes the rationale for using weight-based insulin glargine to facilitate insulin infusion transition?
A. To provide basal coverage
B. To determine whether patient will require insulin glargine as an out
C. To decrease the frequency of bolus multiple daily injections
D. To provide basal coverage

KO is a 55 yo male admitted for a COPD exacerbation. He has a known history of T2DM, and he is currently receiving a continuous intravenous insulin infusion. Which of the following is an appropriate i
A. Base dose = plateau infusion rate x 4; increment = +2; frequency =
B. Base dose = plateau infusion rate x 6; increment = +1; frequency =
C. Base dose = plateau infusion rate x 8; increment = +4; frequency =
D. Base dose = plateau infusion rate x 4; increment = +2; frequency =

Q1 Answer: D  Q2 Answer: A

ACPE Universal Activity Number 121-999-11-147-L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
The goal minimum trough concentration for meningitis is: C 10 mcg/ml

Self Assessment Questions:
The goal minimum trough concentration for meningitis is:
A 5 mcg/ml
B 7.5 mcg/ml
C 10 mcg/ml
D 15 mcg/ml

The Modified Matzke nomogram recommends a maintenance dose of:
A 7.5 to 10 mg/kg
B 10 to 12.5 mg/kg
C 15 to 20 mg/kg
D 22.5 to 27.5 mg/kg

Q1 Answer: D  Q2 Answer: C

ACPE Universal Activity Number 121-999-11-064 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
A REVIEW OF SELECTIVE SEROTONIN REUPTAKE INHIBITOR USE IN ELDERLY INPATIENTS: DETERMINING APPROPRIATE PRESCRIBING PRACTICES
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Background:
Selective serotonin reuptake inhibitors (SSRIs) account for 78% of prescribed antidepressants in the elderly and primary care physicians write more than 75% of these antidepressant medications. Although there is equal efficacy among the SSRIs, differences exist in their potency, receptor selectivity and pharmacokinetic profiles. Factors contributing to drug absorption, distribution and elimination are significantly changed in elderly adults as a result of several causes. A recent consensus panel developed a list of preferred SSRIs for use in the elderly based on factors such as tolerability, pharmacokinetics, and P-450 interactions. Expert review of the SSRIs determined that escitalopram and citalopram were the most preferred SSRIs while sertraline was slightly more preferred than neutral preference and paroxetine, fluoxetine and fluvoxamine were all non-preferred.

Purpose:
Currently, it is unknown if local elderly inpatients are being prescribed preferred SSRIs. A retrospective review of hospital records will determine what types of SSRIs are being utilized. A survey given to prescribers regarding SSRIs, will help establish the level of awareness of differences in SSRIs.

Methods:
This is an Institutional Review Board approved retrospective review of hospital records from January 2007 to December 2009 which included patients aged 65 years or older who were currently receiving an SSRI. The type of SSRI, as well as the dose, age and gender of the patient were recorded. A survey including general knowledge questions about preferred SSRIs was also distributed to local prescribers. Primary outcomes from this research include the percentage of use of each type of SSRI and the frequency of preferred SSRI use in the subjects. Secondary outcomes include a general evaluation of prescribers knowledge regarding SSRIs. An educational presentation aimed at prescribers will be conducted depending on the outcome of the survey results.

Results:
Results and conclusions to be presented at the Great Lakes Residency Conference

Learning Objectives:
Recognize the pharmacokinetic and pharmacodynamic differences among selective serotonin reuptake inhibitors.
Identify preferred selective serotonin inhibitors for use in the elderly.

Self Assessment Questions:
Which selective serotonin reuptake inhibitor has anticholinergic properties?
A. citalopram
B. paroxetine
C. sertraline
D. escitalopram
Which selective serotonin reuptake inhibitor is preferred for use in the elderly?
A. fluvoxamine
B. paroxetine
C. fluoxetine
D. citalopram

ACPE Universal Activity Number 121-999-11-160-L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

RIBAVIRIN FOR THE TREATMENT OF RESPIRATORY VIRAL INFECTIONS: A RETROSPECTIVE CHART REVIEW
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Background:
Ribavirin is the only anti-viral drug in clinical use for the management of paramyxovirus infections. The difficulty in administration of aerosolized ribavirin and the cost of treatment limits the use of this drug. Administered orally, ribavirin is well absorbed, with a bioavailability of 50-75%. Currently few studies exist focusing on the treatment of respiratory viral infections (RVI) with oral ribavirin in immunosuppressed patients.

Purpose:
Evaluate the use of oral ribavirin for the treatment of respiratory viral infections and to compare morbidity and mortality in patients treated with oral versus inhaled ribavirin.

Methods:
This is an institutional review board approved retrospective cohort study of immunocompromised patients ≥18 years of age who received ribavirin for the treatment of respiratory viral infections between 8/2006 and 8/2010. Patients were excluded if they were less than 18 years of age, pregnant, or received ribavirin for use other than for the treatment of respiratory viral infections. Patients who received any formulation of ribavirin were identified using pharmacy database reports. Patient demographics were collected including: age, weight, height, underlying disease, and immunosuppression. In addition the following data was collected: type of infection, route of ribavirin, dose of ribavirin, duration of treatment, administration of intravenous immune globulin (IVIG), administration of palivizumab, pertinent laboratory data, requirement of intubation, admittance to a critical care unit, and survival at 28 days.

Results/Conclusion: Pending

Learning Objectives:
Recognize the optional routes and dosing regimens of ribavirin for the treatment of respiratory viral infections.
Identify the obstacles of nebulized ribavirin for the treatment of respiratory viral infections.

Self Assessment Questions:
Which of the following is not an appropriate dosing regimen of ribavirin?

A. Nebulized ribavirin 2 grams three times daily
B. Nebulized ribavirin 6 grams administered over 18 hours
C. Ribavirin 10mg subcutaneous 3 times daily
D. Ribavirin 400mg by mouth twice daily

The following is an obstacle for the use of nebulized ribavirin for the treatment of respiratory viral infections:

A. The cost of the treatment
B. The cost in administration
C. Difficulty of administration
D. All of the above

Q1 Answer: C Q2 Answer: D

ACPE Universal Activity Number 121-999-11-172-L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
EVALUATION OF PROPHYLACTIC ANTIBIOTIC USE IN NEUROSURGICAL PATIENTS WITH EXTERNAL VENTRICULAR DRAINS (EVDs)
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Purpose:
External ventricular drains (EVDs) allow drainage of excess cerebrospinal fluid (CSF) to reduce intracranial pressure (ICP). The most common risk associated with EVDs is infection, with an incidence reported from 4% to 20%. Currently, the Brain Trauma Foundation guidelines do not advocate prophylactic antibiotic use. The purpose of this study is to characterize the prescribing pattern of antibiotic prophylaxis in patients with EVDs in our institution as well as pertinent infectious complications that may arise.

Methods:
This retrospective chart review consisted of adult patients admitted to Beaumont Hospital who required an EVD for at least 24 hours during their admission. These patients were identified using ICD-9 codes for ventriculostomy and the first 100 patients identified in reverse chronological order were included. Exclusion criteria included shunt revision, preexisting CSF infection, or another infection requiring antibiotics 2 weeks prior to EVD placement. Data collection included: Patient demographics, prescriber, antibiotics used (including dose and length of therapy), presence of infection, and discharge disposition. Patients were monitored closely for CSF infection while the EVD was in place and up to 14 days after its removal. Other infectious complications including sepsis, pneumonia, urinary tract infection, wound infection, Clostridium difficile, and fungal infection were recorded. New colonization or infection with resistant organisms was also tracked.

Results:
Preliminary results of 51 patients show that approximately 49% (25) received prophylactic antibiotics. The most common antibiotic used was cefazolin. Overall, CSF infection occurred in 7 (13.7%) cases, with 6 cases occurring in those patients who received prophylactic antibiotics. The most common complication was pneumonia, which occurred in 18 subjects, 14 of them received prophylaxis. Data collection/analysis is ongoing and will be presented in their entirety at the Great Lakes Residency Conference.

Learning Objectives:
- Review the role of prophylactic antibiotic use in patients receiving external ventricular drains.
- Identify the complications that may occur as a result of using prophylactic antibiotics in EVD patients.

Self Assessment Questions:
Which of the following is TRUE regarding prophylactic antibiotic use in patients with EVDs?
A: All patients having an EVD placed should receive prophylaxis
B: Currently, the Brain Trauma Foundation does not advocate use of prophylaxis
C: Failure to use prophylaxis will result in meningitis
D: IDSA guidelines recommend prophylactic antibiotics in all EVD patients

Which of the following is a common complication that occurs as a result of prophylactic antibiotic therapy in patients with EVDs?
A: Elevated serum creatinine
B: Fungal infection
C: Elevated liver enzymes
D: Pneumonia

CHARACTERIZATION OF THE EPIDEMIOLOGY OF VENTRICULAR ASSIST DEVICE INFECTIONS
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Background: Implantations of ventricular assist devices (VAD) have been used effectively in patients with end-stage heart failure as a bridge to transplantation. More recently, VADs are being utilized as a long term care option, known as “destination therapy”, in patients ineligible for cardiac transplantation. In REMATCH, the landmark study that allowed for FDA approval of VADs, sepsis was the most common cause of death in study subjects. Infections occurring early after VAD implantations are anticipated and are most commonly due to Gram-positive species. Although late onset infections can lead to increased mortality, data characterizing late VAD infection is lacking. Better understanding of the epidemiology of these infections will result in more appropriate selection of empiric antibiotic therapy. The purpose of this study is to characterize the clinical course of VAD infections over time. We hypothesize the infectious etiology of VAD infections will change based on the length of VAD implantation.

Purpose: The purpose of this study is to characterize the epidemiology and microbiology of VAD infections over time stratified by patient morbidity status.

Methods: A retrospective, cohort study will analyze patients receiving a VAD between 01/05 and 11/10. Patients that expire during the procedure or within 72 hours post implantation will be excluded from the data set, along with patients <18 years of age. Patients will be followed until death, heart transplantation, removal of device, or survival with the same device until the end of follow-up (minimum of one year). Infections related to VAD will be classified according to length of time to VAD-related infection and microbiological characterization of infection. Results/Conclusions:
Data collection and analysis are currently ongoing. Results will be presented at the Great Lakes Residency Conference.

Learning Objectives:
- Review the purpose of VADs and recognize the impact of infectious complications.
- Describe risk factors for VAD-related infections.

Self Assessment Questions:
Indications for VAD implant include all of the following except:
A: End-Stage Heart Failure responsive to optimal medical management
B: End-Stage Heart Failure not responsive to optimal medical management
C: Ineligibility for cardiac transplantation
D: Bridge therapy to cardiac transplantation

Established risk factor for a VAD-related infection is:
A: Presence of pre-implant acute kidney injury
B: Greater body weight
C: Older age
D: Female gender

Q1 Answer: A  Q2 Answer: C

ACPE Universal Activity Number 121-999-11-176 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
RISK-BASED RASBURICASE DOSING IN THE MANAGEMENT OF ADULT AND PEDIATRIC TUMOR LYSIS SYNDROME

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Background
Rasburicase is a recombinant urate oxidase enzyme used for the treatment or prevention of hyperuricemia for patients at risk for the development of tumor lysis syndrome (TLS). Numerous dosing strategies exist supporting lower doses of rasburicase compared to the manufacturers recommendation. However, there are no clear recommendations on how these lower doses should be utilized. Recently in the Journal of Clinical Oncology, an expert panel proposed new guidelines suggesting a risk-stratified approach to dosing based on risk of TLS. However, the efficacy and appropriateness of this risk based dosing recommendation has not been tested in an institutional setting.

Objective
The primary endpoint of this single center retrospective study is to evaluate and characterize the outcomes of patients receiving rasburicase. Effectiveness will be determined by comparing patients that received rasburicase based on the risk stratified approach versus those that did not. In addition, we will analyze the impact on length of hospital stay, admissions or transfer to ICU, requirement of renal replacement therapy, and cost effectiveness.

Methods
Prior to commencement, this study will receive Institutional Review Board approval. A retrospective Drug Use Evaluation (DUE) to assess the usage of rasburicase in our institution will be performed. Data collected will include demographic information, concurrent allopurinol and hydration use, malignancy type, and dose of rasburicase. Baseline and interval laboratory data to be collected will include: uric acid, serum creatinine, lactate dehydrogenase, white blood cell, blast percentage, potassium, phosphate, and calcium. Patients will be stratified as low, medium, or high risk based on baseline clinical and laboratory data and further assigned to appropriately or not appropriately dosed based on JCO recommendations, comparing expected dose to dose received. Data collection and evaluation is currently being conducted.

Learning Objectives:
- Explain the mechanism of action, FDA indication, and the manufacturer dose and schedule recommendation of rasburicase.
- Describe the risk-based dosing recommendation for rasburicase from the Journal of Clinical Oncology.

Self Assessment Questions:
Which one of the following is correct?
A: The manufacturer dose and schedule of rasburicase is 0.1 mg/kg.
B: The Journal of Clinical Oncology recommends a risk-based reduction.
C: The Journal of Clinical Oncology recommends patients with malignancy.
D: Allopurinol is also FDA approved for the treatment of tumor lysis syndrome.

Which of the following statements is incorrect?
A: Rasburicase is a recombinant urate oxidase enzyme used for the treatment or prevention of hyperuricemia.
B: Rasburicase is indicated for the initial management of plasma uric acid levels in patients with malignancy.
C: Rasburicase is a xanthine oxidase inhibitor.
D: Tumor lysis syndrome (TLS) can result in hyperuricemia, hyperkalemia, and hypercalciuria.

Q1 Answer: C  Q2 Answer: C

ACPE Universal Activity Number 121-999-11-235-L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5

EARLY DUAL VASOPRESSOR THERAPY COMPARED TO LATE DUAL VASOPRESSOR THERAPY FOR THE TREATMENT OF SEPTIC SHOCK

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Purpose: The Surviving Sepsis Campaign (SSC) guidelines recommend early dual vasopressor therapy for septic shock. The optimal timing of dual vasopressor therapy is not well documented. This study aims to compare early dual vasopressor therapy to late dual vasopressor therapy to determine the impact on mortality.

Methods: A retrospective cohort study conducted at the University of Chicago Medical Center Institutional Review Board approved this trial. A retrospective cohort analysis was performed using electronic medical records. Patients with septic shock were matched with patients without septic shock using propensity score matching. The primary endpoint was 28-day mortality. Secondary endpoints included length of hospital stay, duration of vasopressor therapy, and time to hemodynamic success.

Results and Conclusion: To be presented

Learning Objectives:
- Review physiologic differences between vasopressor agents and their availability when selecting an ideal first line vasopressor agent for the treatment of septic shock.
- Identify the potential role for dual vasopressor agents in the resuscitation of septic shock.

Self Assessment Questions:
Compared to norepinephrine, dopamine is more likely to be associated with:
A: Survival
B: Bradycardia
C: Tachyarrhythmia
D: Physiologic activity primarily at alpha receptors

Which of the following is false?
A: According to the SSC guidelines, vasopressin is recommended as first line vasopressor.
B: The recent VASST trial suggests vasopressin has a potential mortality benefit.
C: Septic shock has a worse prognosis than severe sepsis.
D: Phenylephrine has physiologic activity only at alpha receptors.

Q1 Answer: C  Q2 Answer: A

ACPE Universal Activity Number 121-999-11-317-L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
RETROSPECTIVE EVALUATION OF THE EFFECTIVENESS AND SAFETY OF DROTRECOGIN ALFA ACTIVATED IN PATIENTS WITH SEVERE SEPSIS
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Purpose
To compare the effectiveness (hospital mortality) and safety (serious bleeding complications) of drotrecogin alfa activated in patients with severe sepsis to results from the Recombinant Human Activated Protein C Worldwide Evaluation in Severe Sepsis (PROWESS) study.

Methods
This is an investigator initiated, single-center, retrospective study to be conducted at Riverside Methodist Hospital in Columbus, Ohio. All hospitalized patients admitted between 8/2007 to 8/2010 receiving any drotrecogin alfa activated, regardless of level of compliance with guidelines for use, will be included. Data to be collected includes: admission and demographic information, including age, past medical history, baseline bleeding risk factors/conditions as outlined in the package insert; total body weight and dosing weight; lab values including hemoglobin, aPTT, PT, INR, and platelets at admission, baseline, and during infusion; number of hours and percentage of 96 hour infusion completed; time from multi-organ failure to treatment initiation; reasons for infusion interruption and the amount of time the infusion is interrupted; patient qualifications meeting the criteria for use; severity of illness markers including APACHE II and SOFA score at baseline, the need for mechanical ventilation and vasopressors/inotropes on admission, baseline, and during infusion; hospital length of stay, all cause mortality, and serious bleeding events; and pre-printed order (PPO) compliance.

Results
Data collection is still ongoing and final results will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Review findings from previously published clinical trials evaluating the safety and effectiveness of drotrecogin alfa activated in patients with severe sepsis.
Describe patient outcomes related to treatment including relationships between lab abnormalities and adverse outcomes.

Self Assessment Questions:
Which of the following was reported as the mortality rate in the drotrecogin alfa activated group in the Recombinant Human Activated Protein C Worldwide Evaluation in Severe Sepsis (PROWESS) study?
A 15.6%
B 33.2%
C 24.7%
D 21.1%

Which of the following variables was not assessed in this study?
A Cost
B Hospital length of stay
C APACHE II score
D Need for mechanical ventilation

Q1 Answer: C Q2 Answer: A

ACPE Universal Activity Number 121-999-11-196 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

THE EFFECT OF HALOPERIDOL LOADING DOSE ON THE DURATION OF DELIRIUM
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PURPOSE: The purpose of this study is to compare the efficacy and safety of delirium medication regimens in elderly patients that received a haloperidol loading dose versus those that did not receive a haloperidol loading dose.

METHODOLOGY: This is a matched, case-control, retrospective chart review evaluating delirium treatment with and without a haloperidol loading dose in elderly patients. Charts of patients greater than 60 years old, admitted to Akron City and St Thomas Hospitals that had a positive delirium score reported to the pharmacy between June 2009 and October 2010 will be reviewed. Patients with drug withdrawal, psychiatric conditions, on antipsychotics prior to admission, with Parkinsons disease, in intensive care, as well as those without a nursing plan of care for non-pharmacological therapies will be excluded. Patients receiving haloperidol loading doses (cases) will be matched to those not receiving haloperidol loading doses (controls) for age, gender, history of dementia, presence of documented infection, prevalent delirium, highly anticholinergic medications. The primary endpoint of this study will be the time, in hours, from the initial medication administration until two consecutive negative delirium scores are recorded for the case patients versus the control patients. The discharge disposition, deaths before discharge, QTc prolongation, and length of stay will be collected and will all be the secondary outcomes. To find a 30% difference between the two groups in the time to two consecutive negative delirium scores, 100 case-matched patients will need to be enrolled to reach an 80% power with a p-value of less than or equal to 0.05.

RESULTS: This study is in progress. Results and conclusion will be presented at the Great Lakes Residency Conference.

Learning Objectives:
Recognize the impact of delirium on patient outcomes.
Discuss delirium prevention and treatment measures.

Self Assessment Questions:
Patient A is an elderly patient who has an acute myocardial infarction. Patient B is an elderly patient who is septic. Patient C is an elderly patient with delirium. According to data presented in th
A Patient A
B Patient B
C Patient C
D: Mortality risks of Patients A, B and C are roughly the same

Haloperidol is preferred over lorazepam in the treatment of non-alcoholic delirium due to which of the following reasons?
A Lorazepam is not FDA approved for the treatment of delirium
B Haloperidol has a faster onset than lorazepam
C Haloperidol is less likely to worsen delirium symptoms
D Lorazepam is more likely to cause QTc prolongation

Q1 Answer: D Q2 Answer: C

ACPE Universal Activity Number 121-999-11-396 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5
EMERGENCY PHARMACIST IMPACT ON HEALTHCARE-ASSOCIATED PNEUMONIA EMPIRIC THERAPY
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Purpose: Emergency Medicine physicians must frequently make the distinction between community acquired (CAP) and health care associated pneumonias (HCAP) in order to provide appropriate empiric antimicrobial therapy. Emergency medicine pharmacists (EPH) have the knowledge necessary to evaluate patients for risk factors associated with HCAP and the skills needed to initiate appropriate antimicrobial therapy at optimal doses. By having EPH involved directly in the care of these patients, we anticipate an improvement in appropriateness and timeliness of therapy.

Methods: This will be a retrospective chart review of patients who presented to the Emergency Department (ED) between September 1, 2008 to June 30, 2010. Two study groups will be assessed, the control group will be those HCAP patients who presented to the ED outside of the EPH hours (23:00-13:00), and the study group will consist of those patients who presented during the EPH shift (13:00-23:00). The primary objective of this study is to evaluate the impact of the EPH on the identification of patient risk factors for HCAP by evaluating the appropriateness of empiric antibiotic therapy. Secondary objectives are to determine if the EPH affects empiric dosing of antibiotics, time to administration of antibiotics, and if appropriate antibiotic therapy affects intensive care unit length of stay (LOS) and hospital LOS.

Results: Study in progress

Conclusion: Study in progress

Learning Objectives:
Recognize the risk factors for healthcare-associated pneumonia.
List the proper empiric antibiotics for healthcare-associated pneumonia.

Self Assessment Questions:
Which of the following is not a risk factor for health-care associated pneumonia?
A: Recent chemotherapy (last 30 days)
B: Residence in nursing home
C: Home wound care
D: Recent community acquired pneumonia

All of these antibiotics would be appropriate for health-care associated pneumonia except:
A: vancomycin
B: cefepime
C: ampicillin/sulbactam
D: tobramycin

Q1 Answer: D Q2 Answer: C

ACPE Universal Activity Number 121-999-11-107 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

IMPACT OF A PHARMACIST LEAD EDUCATIONAL CLASS ON INHALER TECHNIQUE AND COMPLIANCE IN PATIENTS DIAGNOSED WITH A COPD CURRENTLY BEING TREATED WITH MULTIPLE INHALERS.
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Purpose:
To assess whether a pharmacist run educational class on inhaler technique, method of action of medications, and proper usage of medications results in more appropriate use of inhalers in chronic obstructive pulmonary disease (COPD) patients at the Chalmers P. Wylie Veterans Affairs Ambulatory Care Center. The primary outcome of the study is whether or not technique scores improved after attending the educational class run by a pharmacist.

Methods:
Patients will be chosen to participate from the veteran population that receives care from this outpatient facility if he or she is currently diagnosed with COPD and receiving treatment with at least two inhalers including albuterol, ipratropium, mometasone, formoterol, tiotropium, or the combination product of albuterol and ipratropium. Patients will be randomized and those qualifying based on inclusion/exclusion criteria will be contacted with a target study population of 110 patients. Qualifying patients will be mailed a letter stating the purpose of the study and then will be contacted via telephone and presented with the opportunity to enroll in the inhaler class. Patients will fill out a pre-class survey to document current compliance with each inhaler. Patients will then be asked to demonstrate inhaler technique using placebo inhalers for each of the individual's active prescription orders and will be scored using a standardized scoring sheet. Education will then be provided including how each medication works, a demonstration of correct technique, importance of compliance, and when each medication should be used. After the education piece, patients will again be asked to demonstrate inhaler technique and will be scored using the same standard scoring sheet. Thirty days after attending the class, patients will be telephoned for a follow up survey using the same survey questions. Results/Conclusions:
Results will be presented at the Great Lakes Residency Conference.

Learning Objectives:
Identify the need for verifying accurate inhaler technique.
Discuss opportunities for pharmacists to increase compliance with inhaler medications.

Self Assessment Questions:
Which of the following statements is true?
A: The majority of patients can use an inhaler appropriately by reading
B: Patients who use multiple inhalers are more likely to make mistakes
C: Physicians are the most effective at teaching appropriate inhaler use
D: It is safe to assume that patients who are getting a refill on an inhaler

Which of the following are ways pharmacists can increase appropriate use and compliance with inhaler medications?
A: Looking at refill dates to make sure inhalers are refilled regularly.
B: Referring the patient back to their physician for instruction.
C: Having patient demonstrate how they will use the inhaler
D: A & C

Q1 Answer: B Q2 Answer: D

ACPE Universal Activity Number 121-999-11-186 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
ALTEPLASE VERSUS RETEPLASE FOR TREATMENT OF PERIPHERAL ARTERIAL AND PERIPHERAL VENOUS OCCLUSIONS
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Purpose:
Peripheral arterial occlusion (PAO) and peripheral venous occlusion (PVO) can result in ischemia to the affected limb, often requiring immediate revascularization for limb salvage. Thrombolytic therapy is a potential treatment option to dissolve formed blood clots. Reteplase was the thrombolytic agent of choice at Saint Joseph Hospital until the agent was placed on indefinite manufacturer backorder in September 2009. Since then, alteplase has replaced reteplase for PAO/PVO. Despite the similarities between the two agents, there is no established dosing conversion with alteplase dosed in mg/hr and reteplase dosed in units/hr. The objective of this study is to compare the safety and efficacy of alteplase and reteplase therapy for the treatment of peripheral arterial and venous occlusion.

Methods:
This retrospective, cohort study has been approved by the Institutional Review Committee at Saint Joseph Hospital. Patients who underwent catheter directed therapy with alteplase or reteplase between October 2007 and July 2010 will be included. Patients will be excluded if they are under 18 years of age, have incomplete medical records, concomitant warfarin therapy with an INR greater than 1.1, or underlying bleeding disorders. The following data will be collected for each patient: patient demographics and baseline characteristics, type and location of occluded vessel, dose and duration of alteplase and reteplase infusions, degree of lysis achieved (successful or not successful) per post procedure angiogram, bleeding events, and complications (death, stroke, distal embolization, limb loss, need for repeat infusions). The primary endpoint of this study will be successful revascularization using reteplase versus alteplase. The secondary endpoints will be incidence of major and minor bleeding as well as incidence of complications associated with thrombolytic therapy.

Results:
Data collection is still in progress. Final results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Describe the mechanism of action for alteplase and reteplase. Recall a method used for determining degree of lysis after thrombolytic therapy.

Self Assessment Questions:
What is the mechanism of action for alteplase and reteplase?
A Binds to factor seven and converts plasminogen to plasmin
B Binds to fibrin and converts plasminogen to plasmin
C Binds to fibrin and converts factor X to factor Xa
D Binds to factor seven and converts factor X to factor Xa

Which of the following is used to determine the degree of lysis after thrombolytic therapy
A Angiogram
B CT scan
C Doppler
D V/Q scan

Q1 Answer: B Q2 Answer: A

IMPLEMENTATION OF A PHARMACIST TELEPHONE FOLLOW-UP PROGRAM IN POST DISCHARGE HOSPITALIZED PATIENTS AT A COMMUNITY TEACHING INSTITUTION
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PURPOSE:
Patient satisfaction with hospital services is measured by the Centers for Medicare & Medicaid (CMS) using the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) tool. Recent data from 2008 to 2009 of hospitals reporting HCAHPS scores showed an average of only 59% of patients received education on new medications. In comparison, as of December 2010, NorthShore University HealthSystems YTD average for HCAHPS score for communication about new medications was 55%. Results from the current data indicate a need for improvement of medication education for hospitalized patients.

OBJECTIVE:
To design and implement a post-discharge telephone medication education program for hospitalized patients, and assess its impact on patient satisfaction with receiving information pertaining to new medications.

METHODS:
Adult English-speaking inpatients who have received education on new medications from a pharmacist will receive a follow-up phone call within 72 hours of discharge. Two inpatient units at NorthShore University HealthSystem will be included in this program. Inpatient medication education and telephone follow-up will be documented in the electronic medical record (EMR). Patient satisfaction will be evaluated based on changes in HCAHPS scores for the two inpatient units as well as the entire institution. Scores for medication-related HCAHPS questions are collected via phone interview by external consultants at Professional Research Consultants, Inc (PRC). Baseline HCAHPS scores have been retrieved via PRC data from Dec 2010. Monthly scores obtained from the PRC website and provided by the NorthShore Quality Department will be utilized to compare to baseline scores. All data collected will be reviewed and interpreted by the primary investigator and two pharmacists.

RESULTS AND CONCLUSION:
Data collection is ongoing. Results are to be presented at the Great Lakes Residency Conference in April.

Learning Objectives:
Recognize the significance of HCAHPS in pharmacy practice. Discuss the benefits and challenges in establishing a telephone medication program at an institution like NorthShore University HealthSystem.

Self Assessment Questions:
Which of the following statements is correct?
A HCAHPS is a tool developed by TJC that measures patient satisfaction
B HCAHPS is a survey developed by ISMP in order to help improve communication
C HCAHPS is a survey developed by CMS which includes medication-related questions
D HCAHPS is a survey developed by CMS in order to address medication errors

What are the potential benefits associated with a pharmacist-provided telephone medication program?
A Reinforce patients’ knowledge on the indication, usage, and adverse effects
B Drive down patient satisfaction on pharmacy services
C Improve visibility and communication between pharmacists and physicians
D A and C

Q1 Answer: C Q2 Answer: D

ACPE Universal Activity Number 121-999-11-395-L04-P
OUTCOMES ASSOCIATED WITH WARFARIN THERAPY FOLLOWING TOTAL JOINT ARTHROPLASTY: EVALUATING TWO DIFFERENT INR GOALS.
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Background: Patients undergoing total joint arthroplasty (TJA), such as total knee (TKA) or hip (THA) arthroplasty, are at an increased risk for developing a deep-vein thrombosis (DVT) or a pulmonary embolism (PE). Warfarin has demonstrated efficacy as chemoprophylaxis against thromboembolic disease. However, achieving the correct dose of warfarin is challenging, and selecting the goal INR is a matter of preference among physicians. The American College of Chest Physicians (ACCP) guidelines recommend a goal INR of 2.5, range 2-3, for these patients. The American Academy of Orthopaedic Surgeons (AAOS) recommends a goal INR of 2 or less.

Objective: Midwest Orthopaedics at Rush University Medical Center adopted a goal INR of 1.8-2.2 for patients undergoing TKA or THA in April 2009. The previous goal INR was 2-2.5. The recommendation for management of a supratherapeutic INR is to lower the dose or omit one dose of warfarin, and withhold physical therapy in patients with an INR above 3. Our hypothesis is patients with the lower INR goal will have fewer incidences of supratherapeutic INR (above 3), and a lower incidence of postoperative bleeding while continuing to prevent DVT/PE.

Methods: This is a retrospective, chart review study evaluating therapeutic outcomes associated with two INR goals. Patients will be evaluated from one of two groups: those who received TJA between October 2007 and April 2009 (goal INR 2-2.5) and those who received TJA between April 2009 and October 2010 (goal INR 1.8-2.2). 150 patients will be randomized into each study group.

The primary outcome measured will be the percentage of patients with an INR measurement above 3. Secondary outcomes measured include time to goal INR, number of measurements at goal INR, number of measurements between 3-5, number of major/minor bleeding events, and a combined endpoint of DVT/PE occurrence.

Data collection and evaluation currently being conducted.

Learning Objectives:
Discuss the differences in recommendations between the American College of Chest Physicians and the American Academy of Orthopaedic Surgeons regarding goal INR for orthopedic surgery patients.
Explain the recommendation at Rush University Medical Center for total joint arthroplasty patients with an INR above 3.

Self Assessment Questions:
Which of the following statements is correct?
A: The American Academy of Orthopaedic Surgeons recommends a goal INR of 1.8-2.2 for patients undergoing TKA or THA in April 2009.
B: The American Academy of Orthopaedic Surgeons recommends a goal INR of 2 or less for patients undergoing TKA or THA.
C: Selecting the goal INR for orthopedic surgery patients is a matter of preference among physicians.
D: Midwest Orthopaedics new goal INR more closely reflects that of the pharmacy team, and decision making and problem solving will be identified and characterized.

At Rush University Medical Center, the process for managing orthopedic surgery patients with an INR above 3 includes:
A: Withholding physical therapy
B: Continuing the same dose of warfarin that evening.
C: Administration of 5mg vitamin K by mouth.
D: Repeating the INR check every 6 hours.

Q1 Answer: C Q2 Answer: A

ACPE Universal Activity Number 121-999-11-343 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

ASSESSING TECHNICIAN SKILLS AND KNOWLEDGE IN PERFORMING MEDICATION THERAPY MANAGEMENT TASKS IN A COMMUNITY PHARMACY, USING A HUMAN FACTORS APPROACH
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PURPOSE: Pharmacists perceive lack of time and support staff as major barriers to providing Medication Therapy Management (MTM) services. Technicians role in MTM services has not been clearly defined despite reports that they would like an expanded role in patient care. The study goals is to identify and assess the skills and knowledge of technician support to improve efficiency in contributing to an effective MTM workflow within a pay-for-performance, employer-based MTM model.

METHODS: To determine the skills and knowledge necessary for a technician to effectively contribute to the MTM workflow, think aloud verbal protocol, a human factors engineering method, will be used. Think aloud protocol allows researchers to gain insight into underlying goals, strategies, and decisions that the technician will make in the course of their MTM tasks. The technician will be video-recorded while performing MTM related tasks. The recordings will be viewed, and retrospectively analyzed. Tasks that the technician performed, as well as more cognitive elements such as the accessibility and types of information that will be necessary to perform duties, communication with the pharmacy team, and decision making and problem solving will be identified and characterized. Results will include a list of specific tasks that the technician performs and the associated skills and knowledge necessary to effectively perform those tasks.

PRELIMINARY RESULTS: After initial assessment, technician knowledge includes some internet literacy and basic pharmacy interaction knowledge.

Results will be presented at the Great Lakes Pharmacy Residency Conference. The project hopes to provide a model for the provision of MTM services, demonstrate the value of a pharmacy technician and serve as a guideline for pharmacists interested in more effectively incorporating technicians into their patient-centered workflow.

Learning Objectives:
Describe perceived barriers to providing MTM services in a community pharmacy.
Discuss the role of a community-based technician in the provision of MTM services.

Self Assessment Questions:
What major barrier to the provision of MTM services in a community setting has been largely unaddressed?
A: Knowledge of the pharmacist
B: Compensation for the service
C: Time of the pharmacist
D: Willingness of the pharmacist

What tasks can community-based technicians perform to assist in the provision of MTM services?
A: Set up appointments with patients, and call physicians’ offices to g
B: Meet with the patient to go over his or her medications, and provid
C: Input data into a computer documenting system, and perform repc
D: Both A and C

Q1 Answer: C Q2 Answer: D

ACPE Universal Activity Number 121-999-11-365 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5
Purpose: In the Kaiser Permanente Ohio Region, pharmacists are called upon to help manage patients who have had a cardiovascular event. This is done in a pharmacist-managed cardiovascular care clinic however, no investigation into the outcomes of these patients has been done. This study will compare the outcomes of patients in a pharmacist managed group with patients in a usual care (physicians, nurses and physicians assistants) group.

Methods: This study will be performed using a retrospective chart review of approximately 600 total patients who experienced a cardiac event, defined as myocardial infarction (MI), coronary artery bypass graft (CABG), and percutaneous coronary intervention, in 2008 and 2009. The primary outcome measures will be the percentage of patients at goal for systolic blood pressure (SBP) and low density lipoprotein (LDL) within 12 months after the event, as defined by NCEP-ATP III and JNC-VII guidelines, and the average degree of SBP and LDL lowering for each group. Secondary outcome measures will include the number of patient encounters and time (days) required to reach SBP and LDL goals, the percentage of patients prescribed antihyperlipidemic medications, beta-blockers and ACE inhibitors or ARBs, and the proportion of patients with a baseline screening for the following labs; alanine transaminase, aspartate transaminase, serum creatinine, pulse, and blood pressure. We will measure the proportion of patients at goal for the following labs: total cholesterol, triglycerides and high density lipoprotein. Medication adherence, defined as a medication possession ratio of 80% or greater, will also be measured. Demographic information will include age, gender and the percentage of patients with diabetes, hypertension and history of a cardiac event including; MI, angioplasty with stent, CABG, and unstable angina. Statistical analyses will include t-tests to compare continuous data and chi-square analyses to compare categorical data.

Results and conclusions: Results and conclusions are pending.

Learning Objectives:
Identify the essential medications a patient should be prescribed after a cardiac event.
Discuss the proper monitoring with regards to the medications a patient should be prescribed following a cardiac event.

Self Assessment Questions:
Which of the following is a medication that must be prescribed to a patient following a cardiac event?
A Hydrochlorothiazide
B Fish oil
C Metoprolol
D Fenofibrate

Which of the following labs must be monitored when starting an HMG-CoA reductase inhibitor?
A Serum potassium
B Liver function tests
C Blood pressure
D Pulse

Q1 Answer: C Q2 Answer: B

ACPE Universal Activity Number 121-999-11-262 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

Purpose: Standardization of critical pharmacy policies and procedures across all hospitals in an integrated health system is essential. It provides consistent patient care and implements best clinical and operational practices. It also allows for the adherence to legal and regulatory requirements and aligns financial goals of the system as a whole. This project will attempt to develop a methodology to identify critical pharmacy practices across all hospitals in Aurora Health Care.

Methods: Based on these discussions with clinical, practice and administrative decision-making pharmacy leaders across the system, criteria were developed to identify critical pharmacy practices that should be monitored. In addition, a compliance procedure for critical pharmacy practices was established. Effectiveness of the compliance procedure was initially assessed by a system-wide trial of three critical pharmacy practices, narcotic audits, adherence to non-formulary medication policy and allergy policy, using the approved methodology. Compliance results and utility of the compliance process was presented to pharmacy leaders.

A decision regarding the development of a compliance dashboard was made. The dashboard will include critical pharmacy practices requiring ongoing periodic compliance audits and a list of "critical pharmacy practices" without the audit component. The compliance dashboard will be approved by pharmacy management. Re-audits of new and previously identified critical pharmacy practices will be performed. Moreover, pharmacy managers will self-report their compliance to pharmacy policies and practices identified on the "critical pharmacy practices" list.

Results of the compliance audits and pharmacy managers self-acknowledged compliance with "critical pharmacy practices" list will be presented to pharmacy management. Modifications to the dashboard in terms of fluidity of critical policies between the audit lists and "critical pharmacy practices" list will be determined as critical pharmacy issues surface on an ongoing basis.

Conclusion and future project plans will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Discuss criteria to identify critical pharmacy policies and practices in an integrated health system.
Identify barriers to conducting an effective compliance audit in an integrated health system.

Self Assessment Questions:
From our discussion, which of the following could potentially be a major barrier in conducting an effective compliance audit?
A Technology
B Access to audit data
C Monetary limitations
D Compiling audit results/information

From our discussion, an effective management dashboard:
A Includes detailed and redundant information
B Provides most critical and pertinent information in a concise manner
C Overwhelmes managers with information
D Can never be used to assess trends in key performance areas

Q1 Answer: A Q2 Answer: B

ACPE Universal Activity Number 121-999-11-437 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5
EVALUATION OF A PHARMACIST-DRIVEN PROTOCOL FOR THE MANAGEMENT OF ANEMIA OF CHRONIC KIDNEY DISEASE IN TRANSPLANT RECIPIENTS

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Purpose Statement: In 2008, Medicare spent $1.8 billion on erythrocyte stimulating agent (ESA) use. The American Society of Transplantation (AST) recommends ESAs for the management of anemia of CKD post-transplantation per the National Kidney Foundations (NKF) Kidney Disease Outcome Quality Initiative (K/DOQI) guidelines. Total monthly healthcare costs for ESA-treated patients have been shown to be 19% lower than for untreated anemic patients, representing an $882 per patient per month savings with ESA use. Implementation of a pharmacist managed ESA clinic in a different center resulted in potential yearly cost savings and cost avoidance of approximately $116,000, while significantly improving mean hemoglobin and transferrin saturation (TSAT) levels. Our institution, recently implemented a pharmacist-managed anemia protocol in the transplant clinic. The primary objective of this study is to compare the percentage of patients at goal hemoglobin (Hgb) before and after implementation of a pharmacist-managed anemia protocol. Secondary objectives include determining the percentage of patients with appropriate lab monitoring and the percentage of patients appropriately receiving iron therapy. Finally, the economic impact will be evaluated by comparing the number of ESA write-offs in a 6 month period pre and post-implementation.

Methods: This study is a retrospective observational cohort review submitted to the Institutional Review Board for approval prior to its initiation. Adult patients who had received a kidney, liver, or pancreas transplant, had a current diagnosis of CKD stage III-V, received an ESA initiation. Adult patients who had received a kidney, liver, or pancreas transplant, had a current diagnosis of CKD stage III-V, received an ESA initiation. Methods: This study is a retrospective observational cohort review submitted to the Institutional Review Board for approval prior to its initiation.

Preliminary results: Data collection is ongoing.

Conclusions: No preliminary conclusions have been reached at this time

Learning Objectives:

Describe the impact of the implementation of a pharmacist-driven anemia management protocol on the following: percentage of patients at goal Hgb, percentage of patients with appropriate lab monitoring and the percentage of patients appropriately receiving iron therapy. Finally, the economic impact will be evaluated by comparing the number of ESA write-offs in a 6 month period pre and post-implementation.

Conclusions Reached: Conclusions have not been reached at this time as data collection is not complete.

Learning Objectives:

Describe the impact of the implementation of a pharmacist-driven anemia management protocol on the following: percentage of patients at goal Hgb, percentage of patients with appropriate lab monitoring and the percentage of patients appropriately receiving iron therapy. Finally, the economic impact will be evaluated by comparing the number of ESA write-offs in a 6 month period pre and post-implementation.

Self Assessment Questions:

Approximately how many patients who receive a solid organ transplant recipients develop anemia?

A 10%
B 30%
C 60%
D 90%

What is the goal range of hemoglobin for a patient receiving an erythrocyte stimulating agent for the treatment of anemia of chronic kidney disease?

A 9-11 mcg/mL
B 10-12 mcg/mL
C 11-13 mcg/mL
D anything higher than 12 mcg/mL is acceptable

Q1 Answer: B Q2 Answer: B

PATIENT CENTERED MEDICAL HOME IN A COMMUNITY PHARMACY

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The Patient Centered Medical Home (PCMH) is a health care team-based approach to delivering comprehensive, continuous, coordinated care across all life stages and is seen as a potential solution to the discrepancy between the high cost and low quality of health care in the US. Though pharmacy-based interventions have been shown to improve the quality of patient care through medication therapy management programs (MTM), there is a lack of data supporting pharmacists involvement in PCMHs. Pharmacists are uniquely trained and well-positioned to make important contributions to PCMHs as medication therapy experts. The purpose of this study is to track clinical outcomes and document the impact of community pharmacy based medication therapy management (MTM) in patients with chronic disease states being provided care through the patient centered medical home (PCMH) model.

Priority Health Medicare Part D patients with chronic diseases will be scheduled to meet with their Meijer community pharmacist. The community pharmacists will conduct periodic chronic disease state MTM services. During the MTM services, the community pharmacist will obtain consent for treatment, conduct a medication history, complete chronic disease specific assessment forms, and obtain necessary laboratory data including but not limited to: hemoglobin A1c, blood pressures, and lipid panels. Coordinated care will continue collaboratively for these patients, and the community pharmacist will document each MTM service and make recommendations to healthcare providers, as deemed necessary, after each contact. The community pharmacist will document contacts with the healthcare providers and provide appropriate follow-up based on recommendations and/or patient medication related concerns. The impact of these MTM services will be compared to a cohort of patients not receiving community pharmacy-based MTM services.

Summary: Collection of data continues at this time.

Pharmacy-based interventions have been shown to improve the quality of patient care through medication therapy management programs (MTM) in patients with chronic disease states being provided care through the patient centered medical home (PCMH) model.

Learning Objectives:

Describe the patient centered medical home (PCMH) model.

Discuss the potential role of a community pharmacist in a PCMH.

Self Assessment Questions:

1. The patient centered medical home model is based around

A The needs of the physician
B The needs of the pharmacist
C The needs of the payor
D The needs and goals of the patient

As presented today, the role of a community pharmacist in a PCMH may include the following services

A Writing and dispensing medications, referrals to outside providers
B MTM services including medication history, medication counseling
C Contacting payor to discuss obtaining a new physician
D Pharmacists do not have a role in PCMH and should focus on dis;

Q1 Answer: D Q2 Answer: B

ACPE Universal Activity Number 121-999-11-162-L04-P

Activity Type: Knowledge-based Contact Hours: 0.5

121-999-11-091-L01-P

Activity Type: Knowledge-based Contact Hours: 0.5

121-999-11-162-L04-P

Activity Type: Knowledge-based Contact Hours: 0.5
COLLECTION GOAL OUTCOMES ASSOCIATED WITH STEM CELL MOBILIZATION: FILGRASTIM ALONE VERSUS FILGRASTIM AND CHEMOTHERAPY VERSUS FILGRASTIM AND PLEXIRAXFOR.

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Purpose: High dose chemotherapy followed by autologous stem cell rescue is the standard of care for multiple myeloma (MM) and relapsed non-Hodgkin’s lymphoma (NHL). Undergoing autologous stem cell transplant (SCT) requires the collection of CD34+ stem cells prior to high dose chemotherapy for reinfusion. Approximately 10-30 % of patients will not mobilize enough stem cells to proceed to transplant with standard therapy alone. This can result in multiple attempts to mobilize stem cells which may increase healthcare costs and adversely affect patients quality of life. The aim of this study is to compare apheresis requirements and cost of standard filgrastim to other mobilization options.

Methods: This study was a retrospective chart review of patients at the Indiana University Simon Cancer Center (IUSCC) in Indianapolis, Indiana. Inclusion criteria included patients mobilizing stem cells prior to autologous SCT in the treatment of MM or NHL and receiving a mobilization regimen of either filgrastim alone, filgrastim plus chemotherapy (chemo-mobilization) or filgrastim plus plerixafor. Patients were excluded if they were less than 18 years of age or received chemotherapy for reasons other than stem cell mobilization within 4 weeks of mobilization. The primary endpoint was the percentage of patients collecting ≥ 5 x 106 CD34+ cells in ≤ 2 apheresis days. Secondary endpoints included the percentage of patients collecting ≥ 5 x 106 CD34+ cells in ≤ 4 apheresis days, number of days to reach ≥ 5 x 106 CD34+ cells, number of collections required to reach goal, number of CD34+ cells infused, time to neutrophil and platelet recovery and cost comparison. Primary and secondary endpoints will be evaluated between patients described in phase III trials of plerixafor and IUSCC patient population mobilized with filgrastim and chemomobilization.

Results and conclusion: Final results and conclusion will be presented the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Identify risk factors for stem cell mobilization failure.
Recognize efficient and cost-effective methods for successful stem cell mobilization.

Self Assessment Questions:
Which of the following statements is correct?
A: Previous treatment with lenalidomide can increase the mobilization
B: Previous treatment with lenalidomide can increase the mobilization
C: Previous treatment with thalidomide can increase the mobilization
D: Previous radiation therapy can increase the mobilization success r

What percentage of patients will not mobilize enough stem cells to proceed with transplant?
A: 5-10
B: 10-30
C: 30-50
D: 50-70

Q1 Answer: A  Q2 Answer: B

EVALUATION OF THE UTILIZATION OF ANTI-EPILEPTIC THERAPY FOR SEIZURE PROPHYLAXIS IN SUBARACHNOID HEMORRHAGE AT AN ACADEMIC MEDICAL CENTER


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Purpose: Neurosurgical patients presenting with subarachnoid hemorrhage (SAH) are at a higher risk of seizure, due in part to the presence of blood and the location of injury. Current literature suggests limited duration, of 7 days, of anti-epileptic drug (AED) therapy in the immediate (period undefined) posthemorrhagic period. The objective of this study is to quantify the clinical and economic effect of antiepileptic drug use in patients with acute SAH in hopes of enhancing therapy by promoting proper prophylactic usage.

Methods: A retrospective chart review of patients between the ages of 18 and 89 inclusive and admitted to University of Wisconsin Hospital and Clinics (UWHC) between October 1, 2009 and October 1, 2010 with a diagnosis of SAH was conducted. Data analyzed included the type, dose and length of AED prophylaxis, incidence of seizure, and subsequent economic impact of prolonged therapy. Prolonged therapy was defined as greater than seven days of prophylaxis. Patients with a prior history of epilepsy, taking AEDs for any reason, or experiencing alcohol withdrawal were excluded. The primary outcome of the study was an economic and clinical evaluation of AED use in SAH patients at UW/HC with the goal of promoting evidenced based usage of AEDs in this population.

Preliminary data analysis: To date, 68 patients have been evaluated. These patients represent traumatic SAH only. Average length of seizure prophylaxis was 9.2 days, with a range of 1-35 days. Initial data suggests variable prescribing patterns exist and duration AED prophylaxis after SAH often exceeds 7 days.

Data collection and analysis is ongoing and comprehensive results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Discuss the rationale for and against seizure prophylaxis in patients post subarachnoid hemorrhage. Describe appropriate therapy should seizure prophylaxis be initiated.

Self Assessment Questions:
For which of these disease states do randomized controlled trials for the specific duration of seizure prophylaxis exist?
A: Subarachnoid hemorrhage
B: Non-penetrating traumatic brain injury
C: Subdural hematoma
D: Intraparenchymal hemorrhage

What are some of the concerns with long-term seizure prophylaxis in subarachnoid patients?
A: Little evidence to support long or short-term efficacy
B: Increased risk of rebleeding
C: Medication availability
D: Development of withdrawal side effects upon discontinuation

Q1 Answer: B  Q2 Answer: A

ACPE Universal Activity Number 121-999-11-226 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
COMPARISON OF PSYCHOTROPIC MEDICATION UTILIZATION IN PATIENTS WITH SCHIZOPHRENIA AND PSYCHOTIC BIPOLAR DISORDER

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Purpose: Schizophrenia and psychotic bipolar disorder are two psychiatric diseases with distinct diagnostic criteria despite overlapping symptoms that are often managed with the same pharmacologic agents. While guidelines exist for the pharmacologic treatment of both disorders, it is relatively unknown how these guidelines translate to clinical care in a community setting. The Bipolar and Schizophrenia Network for Parsing Intermediate Endophenotypes (BSNIP) study is currently evaluating heritable phenotypes in schizophrenia and psychotic bipolar disorder. Information collected from these patients includes a comprehensive description of the medication regimens of probands as well as healthy volunteers with no history of psychiatric illness. Characterizing these disorders and medication regimens will give insight into actual prescribing patterns across a diverse population. This has the potential to highlight associations between medication use and subject characteristics among a large sample of stabilized patients with these disorders.

Methods: This study was approved by the University of Illinois at Chicago Institutional Review Board. Subjects are identified as those participating in the BSNIP study and have already given informed consent. Study records will be reviewed for age, sex, classes of medications, medication doses, and diagnosis (schizophrenia, bipolar disorder, or healthy volunteer). Clinical assessments reviewed include psychiatric history, medical history, family history, Positive and Negative Symptom Scale (PANSS), Young Mania Rating Scale (YMRS), and the Montgomery and Asberg Depression Rating Scale (MADRS). Descriptive statistics will be performed for all variables; chi-square tests will be used to evaluate differences between diagnostic groups, subject types, and groups based on medication regimens. Students T-tests, analysis of variance, or a non-parametric equivalent will be used to compare outcomes across diagnostic or treatment groups.

Results: Eighty-three patients with schizophrenia and 88 patients with psychotic bipolar disorder are presently included in the analysis. Results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Describe the rationale for using chlorpromazine equivalents to compare psychotropic medication burden across patient groups.
Recognize distinct prescribing patterns in schizophrenia and psychotic bipolar disorder in the community setting.

Self Assessment Questions:
Based on guidelines for medication use in schizophrenia and bipolar disease, a reasonable expectation of the results of this study includes:

A Significant antipsychotic burden in both groups
B Greater use of mood stabilizers in schizophrenia
C Use of medications to attenuate adverse effects in both groups
D Both a and c

What is the advantage of using chlorpromazine equivalents to compare psychotropic medication burden across patient groups?

A Chlorpromazine is a commonly prescribed antipsychotic
B Calculating chlorpromazine equivalents is a widely accepted method
C Multiple studies have been published using chlorpromazine equiva
D Both b and c

DEVELOPING A DRUG INFORMATION FREQUENTLY ASKED QUESTIONS DATABASE

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Background: One of the main functions of a drug information (DI) center is to formally answer requests from health care professionals or the public. The majority of DI centers have an electronic database for documenting requests. A DI database is used to track volume, caller demographics, types and complexity of requests, as well as research time. When requested information is not readily accessible or may require extensive and time consuming research, DI databases containing previously answered questions can assist in efficiently responding to new requests.

Purpose: The purpose of this project is to develop a frequently asked questions DI database to assist pharmacists in providing responses to requests that are not easily accessible from tertiary references at the Cleveland Clinic (CC).

Methods: The CC DI Center has locally developed its own electronic DI database. This database will be queried to determine prominent types of requests, and a survey will be administered to pharmacy staff, including the DI staff, to inquire about requests routinely received in practice in which the answers are not easily accessible from available tertiary references. Using the query and survey results, a DI Frequently Asked Questions (DIFAQS) database will be created using requests and answers from the existing CC DI database. The DIFAQS database will contain 25 to 50 questions and corresponding non-patient-specific answers. The DIFAQS database will be piloted for 6 to 8 weeks by selected pharmacy staff. After the pilot phase, 1) another survey will be conducted, 2) necessary changes will be incorporated, and 3) the database will be released to the pharmacy department. The content of DIFAQS database will be reviewed and updated periodically.

Results and Conclusions: The results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Describe the development of a frequently asked questions DI database to assist pharmacists in providing responses to requests that are not easily accessible.
Discuss the functionality of a frequently asked questions DI database and its integration into the pharmacy workflow.

Self Assessment Questions:
1. What are the two electronic databases which contain previously answered drug information questions?
A Iowa Drug Information Network (IDIN) Answers and DRUGDEX®
B DRUGDEX® Drug Consults and Lexicomp™
C Lexicomp™ and DRUGDEX® Drug Consults
D Lexicomp™ and Epocrates®

What are the main uses of drug information databases?
A Track type of requests, call volume, and caller demographics
B Track call volume and types of requests
C Track research time, types of requests and caller demographics
D Track types of requests, call volume, caller demographics, and research time

Q1 Answer: A Q2 Answer: D

ACPE Universal Activity Number 121-999-11-429 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5
EFFECT OF BLOOD TRANSFUSIONS ON FETAL HEMOGLOBIN IN PATIENTS WITH SICKLE CELL DISEASE WITH AND WITHOUT HYDROXYUREA

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BACKGROUND: Hydroxyurea is approved by the Food and Drug Administration for management of sickle cell SS and S beta thalassemia. Mechanistically, hydroxyurea will increase serum fetal hemoglobin concentrations which will decrease complications of disease as well as potentially improve overall mortality and long term survival. Transfusions of red blood cells can be administered acutely or chronically to sickle cell patients for symptomatic management.

PURPOSE: No literature has been published evaluating the impact of red blood cell transfusions on circulating fetal hemoglobin concentrations. A preliminary unpublished evaluation of 8 patients with sickle cell SS and S beta thalassemia indicates administration of red blood cell transfusions to sickle cell patients on hydroxyurea will result in significant, prolonged suppression of fetal hemoglobin concentrations as well as return of disease complications.

METHODS: This is a single center, retrospective study evaluating the impact of red blood cell transfusions on serum fetal hemoglobin concentrations in up to 100 patients with sickle cell SS or S beta thalassemia. Sickle cell patients managed at UC Health University Hospital, Hoxworth Medical Practices, or the Barrett Cancer Center clinic between January 2004 and September 2010 will be screened. After inclusion, patients will be stratified to two groups based on hydroxyurea therapy plus symptomatic management with red blood cell transfusions or symptomatic management alone. The primary outcome measures are the change in fetal hemoglobin and sickle cell hemoglobin concentrations at baseline and up to 6 months after red blood cell transfusion. Secondary outcome measures include compliance to hydroxyurea therapy, complications of disease after transfusion, and change in erythropoietin levels.

RESULTS AND CONCLUSIONS: The primary and secondary outcomes are still under investigation. Results will be presented at the Great Lakes Pharmacy Residency Conference.

There are no conflicts of interest for the investigators involved and the outcomes of this research.

Learning Objectives:
Identify appropriate candidates for hydroxyurea therapy among the sickle cell population.
Describe potential benefits and detriments associated with administration of packed red blood cell transfusions to sickle cell patients.

Self Assessment Questions:
Which of the following sickle cell patients would be the most appropriate candidate for hydroxyurea therapy to prevent further disease complications?
A: Patient 1: SC disease with 2 episodes of acute chest syndrome in the last month
B: Patient 2: SS disease with a history of an ischemic stroke
C: Patient 3: S-beta thalassemia with severe pulmonary hypertension
D: Patient 4: SS disease with 3 vaso-occlusive crises in the last month

Which of the following statements about transfusing packed red blood cells to sickle cell patients is true?
A: It is a benign process with limited risk associated to the patient
B: Packed red blood cells can acutely alleviate disease symptoms by increasing oxygen delivery to tissues
C: Sickle cell patients should be transfused to maintain a hemoglobin level between 10-12 g/dL
D: There is no risk of iron overload associated with administering multiple transfusions per year

Q1 Answer: D Q2 Answer: B

ACPE Universal Activity Number 121-999-11-202 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
EVALUATION OF INHALER TECHNIQUE IN ASTHMA AND CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) PATIENTS IN A PRIMARY CARE SETTING

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Purpose: Patients with asthma and COPD who use their inhalers incorrectly are more likely to have poor symptom control and increased use of emergency medical services. Studies have shown inhaler technique can be improved with demonstration and verbal instruction of correct inhaler technique. The purpose of this study is to assess if asthma and COPD patients in a primary care setting are using their inhalers with correct technique and to evaluate the impact of pharmacist intervention on the way asthma and COPD patients use their inhalers.

Methods: This prospective study will include patients who present to an appointment at Blanchard Valley Medical Associates. Inclusion criteria: greater than 18 years old, English-speaking, a diagnosis of asthma or COPD, an active prescription for a study approved inhaler [albuterol metered-dose inhaler (MDI), fluticasone/salmeterol dry powder inhaler (DPI), mometasone DPI, or tiotropium DPI], and ability to use inhaler without assistance from another individual. Patients who meet the inclusion criteria will be asked to participate in the study and sign informed consent. Patients will complete a questionnaire on current symptoms and quality of life, and then will demonstrate how they use their inhalers at home using placebo inhalers. A pharmacist will evaluate inhaler technique and educate the patient on the correct use of the inhalers through demonstration, along with verbal and written instructions. Patients will be asked to participate in a follow-up visit two - three months after the initial visit to reassess symptom control and to evaluate inhaler technique. The results from the questionnaire and demonstration at the initial visit will be compared to the results collected at the follow up visit. For statistical analysis, t-tests will be performed using SPSS software.

Results/Conclusions: Data collection and analysis is ongoing. Results will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Discuss the impact of pharmacist intervention on improving inhalation technique and symptom control in patients with asthma or COPD.
Identify if asthma and COPD patients in a primary care setting are using their inhalers with correct technique.

Self Assessment Questions:
Pharmacist asthma and COPD education clinics have shown to decrease
A Symptoms by 50%
B Hospitalizations by 60%
C Emergency department visits by 85%
D Annual cost of hospitalizations by 75%

Which of the following factors is associated with incorrect inhalation technique?
A Mild pulmonary disease
B Higher educational level
C Older age
D Female gender

Q1 Answer: B Q2 Answer: C

ACPE Universal Activity Number 121-999-11-257 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

EFFECT OF CLINICAL PHARMACY SERVICES ON DIABETIC TREATMENT GOALS IN A NEWLY ESTABLISHED VETERANS AFFAIRS OUTPATIENT CLINIC

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Purpose: The Robley Rex Department of Veterans Affairs Medical Center (VAMC) instituted a pharmacist-operated Medication Therapy Management (MTM) Clinic in 2008 to manage patients with diabetes, hypertension, and dyslipidemia. The purpose of this study is to determine if differences in A1C, blood pressure, and LDL occurred in diabetic Veterans after receiving care at the MTM Clinic. Additionally, the study aims to determine the proportion of patients achieving their respective treatment goals.

Methods: Institutional Review Board (IRB) approval was granted to conduct a retrospective, cohort analysis of a single-healthcare system. Veterans with a diagnosis of Diabetes Mellitus Type 2, who received care at the MTM Clinic a minimum of six months between July 08, 2008 and August 31, 2010, will be eligible for inclusion in the study. Veterans with diagnosis of Diabetes Mellitus Type 1, who missed greater than 50% of their appointments, or had a date of death on or prior to August 31, 2010, will be excluded.

The primary endpoint is the mean difference in A1C after six months of care at the MTM Clinic, relative to baseline. The secondary endpoints are the mean difference in systolic/diastolic blood pressure and LDL after six months of care at the MTM clinic, relative to baseline. The mean difference in the number of patients at their goal A1C, systolic/diastolic blood pressure, and LDL after six months of care at the MTM clinic will also be compared to baseline. Demographic information will be collected to provide a description of the study population.

Statistical analysis of the primary and secondary endpoints will be conducted using the t-Test. Demographic parameters will be analyzed using percentages of the entire study population.

Results and Conclusions: Results and conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:
Recognize the role of clinical pharmacy services in primary care settings
Discuss the impact of clinical pharmacy services in the management of diabetic Veterans on A1C, LDL, and blood pressure.

Self Assessment Questions:
Which of the following is a benefit provided to patients who are followed by the MTM Clinic at the Robley Rex VAMC?
A Decreased frequency of office visits
B Increased medication compliance
C Increased patient-provider contact time
D Decreased driving distance to clinic visits

Which of the following is a potential outcome of the study results?
A Minimize pharmacist workload
B Revise MTM Clinic policies and procedures
C Decrease provider utilization of the MTM service
D Expand use of the MTM Clinic to additional disease states

Q1 Answer: C Q2 Answer: B

ACPE Universal Activity Number 121-999-11-158 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
DIETARY SUPPLEMENT EDUCATION IN AN ELDERLY POPULATION
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Purpose: The purpose of this study is to evaluate the efficacy of pharmacist-led education in a local elderly population, focusing on the safe use of dietary supplements.

Methods: In order to accurately assess the study objective, the project will occur in two phases. Initially, a needs-assessment survey will be conducted at a health fair within a local senior organization. At that time surveys focused on dietary supplement use will be delivered to study subjects. Following the health fair, surveys will be analyzed in order to determine the most commonly used dietary supplements. The second phase of the project will be the delivery of three education seminars, with a focus on incorporation of the initial survey analysis. One educational seminar presenting general information for dietary supplement use and two seminars about the most commonly used products will be developed and delivered to the same population in the spring of 2011. A pre- and post-assessment will be done during the seminars to gauge baseline knowledge and impact of pharmacist education. Additionally, results will be analyzed for any change in attitudes about dietary supplements.

Preliminary results: Forty-nine subjects were surveyed about their use of dietary supplements at the initial health fair. Subjects were primarily African American females with an average age of 72 years. Among these subjects, 81.6% were taking at least one supplement. The most commonly used supplements were calcium (n=23), multivitamins (n=22) fish oil (n=13), and vitamin B (n=12). The population took an average of 5.33 prescriptions on a daily basis, and 17.5% of those who used dietary supplements had not informed their physician of their use.

Conclusions: Based on the results from the health fair survey, it is evident that members of the study population are using dietary supplements. An educational session on dietary supplements may benefit this population.

Learning Objectives:
List common dietary supplements used in the elderly population.
Discuss current evidence-based recommendations for certain dietary supplements.

Self Assessment Questions:
What was the most common dietary supplement consumed by the study population?
A: Iron
B: Calcium
C: Vitamin B
D: Fish Oil

What is the current recommended daily intake of calcium in persons aged 50 years and older?
A: 1000 mg
B: 1500 mg
C: 1200 mg
D: 800 mg

Q1 Answer: B  Q2 Answer: C

ACPE Universal Activity Number 121-999-11-377 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5

CHARACTERIZATION OF CANNABINOID USAGE IN A PEDIATRIC ONCOLOGY POPULATION
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Purpose: Chemotherapy-induced nausea and vomiting (CINV) remains an important side effect associated with the administration of chemotherapy in the pediatric population. Poorly controlled CINV leads to physical, emotional, and psychological stressors that result in poor compliance and treatment interruptions within this vulnerable population. There is a gap in understanding the best treatment and prevention of pediatric CINV. Current supportive care guidelines are based on minimal randomized, prospective data in this population.

Dronabinol serves as a therapeutic alternative for pediatric CINV. One small study has reported on the usefulness of dronabinol in a pediatric population. The aim of this pilot study is to retrospectively study dronabinol use in a large academic pediatric cancer center with the intent of characterizing its use and identifying potential trends such as age, gender, diagnosis, and chemotherapy that describe where dronabinol is best used as an adjuvant antiemetic.

Methods:
Patients receiving dronabinol at Riley Hospital for Children from January 1, 2000 through July 30, 2010 were identified. Patients eligible for study inclusion were those with malignancy ≤ 18 years old who received at least one dose of dronabinol during their admission. The following data parameters were collected: patient demographics, the number of emetic events experienced while on dronabinol and in the previous chemotherapy cycle during which they did not receive dronabinol, the use of rescue anti-emetics while the patient received dronabinol, repeat dronabinol courses in subsequent cycles, and outpatient prescriptions written for dronabinol.

Results and Conclusions:
Data collection is in progress, and results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Identify appropriate antiemetic regimens based on pediatric guidelines.
Define the current role in therapy for dronabinol.

Self Assessment Questions:
At a minimum, a chemotherapy regimen of moderate emetogenic potential should include:
A: Aprepitant and Ondansetron
B: Dexamethasone and Ondansetron
C: Dronabinol and Ondansetron
D: Lorazepam and Promethazine

Dronabinol has a labeled indication for:
A: Acute nausea and vomiting
B: Anticipatory nausea and vomiting
C: Delayed nausea and vomiting
D: Nausea and vomiting refractory to other antiemetics

Q1 Answer: B  Q2 Answer: D

ACPE Universal Activity Number 121-999-11-124 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

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Background: Peripheral blood stem cell transplant (PBSCT) is a common treatment option for patients with hematologic malignancies. The conditioning chemotherapy regimens used prior to transplant induce a period of pancytopenia. During this period, granulocyte-colony stimulating factors (filgrastim) are commonly used to enhance proliferation and maturation of neutrophil granulocytes. When these agents are administered after autologous PBSCT, they decrease the duration of neutropenia and incidence of neutropenic fever (NF), as well as the length of hospitalization, and may reduce costs. The recommended dosing schedule for this indication is once daily. However, hematology/oncology prescribers at Northwestern Memorial Hospital (NMH) often order filgrastim twice daily for this indication. It is thought that the twice daily regimen may be associated with a shorter duration of neutropenia and less infections. There is no evidence to support this regimen for post-autologous PBSCT.

Purpose: To assess the clinical benefit of using twice daily filgrastim versus once daily filgrastim for the purpose of neutropenic recovery post autologous PBSCT. The primary outcome of this study is time to reach absolute neutrophil count (ANC) greater than or equal to 1000/mm3. The secondary outcome is incidence of suspected infection, as measured by use of intravenous antibiotics and incidence of fever (T>100.4 F).

Methods: The design is a retrospective, cohort study that will be performed by reviewing the database of patients at NMH who have undergone autologous PBSCT. Of those patients, those who received once daily filgrastim (20 mcg/kg SC/IV daily) will be compared to those who received twice daily filgrastim for neutropenic recovery post-transplant. Patients with any type of hematologic malignancy will be included. Patients who receive PBSCT for therapy of solid tumors will be excluded. Patients will be stratified by type of conditioning regimen, as different regimens are associated with varying degrees of neutropenia.

Results/Conclusion: Data analyses are ongoing. Research results and associated with varying degrees of neutropenia.

Learning Objectives:
Identify the FDA-approved dosing for filgrastim in chemotherapy-induced neutropenia and febrile neutropenia. Describe the risks associated with PBSCT.

Self Assessment Questions:
Which of the following is FDA-approved dosing for filgrastim in chemotherapy-induced neutropenia and febrile neutropenia?
A. 5 mcg/kg SC/IV BID
B. 20 mcg/kg SC/IV daily
C. 5 mcg/kg SC/IV daily
D. 10 mcg/kg SC/IV BID

Which of the following are risks for patients who undergo PBSCT?
A. Thrombocytosis
B. Heart failure
C. Nystagmus
D. Viral infections

Q1 Answer: C  Q2 Answer: D

ACPE Universal Activity Number 121-999-11-224 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5

Protocolized and Target-Based ICU Management of Sedation, Analgesia and Delirium: The Protection Study

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Purpose: The management of analgesia, sedation and delirium in critically ill patients has become an increasingly studied area of interest. The purpose of this study is to improve patient care by implementing a new strategy for managing critically ill patients that will provide adequate comfort, while avoiding the overuse of medications and associated adverse events. The results will also be used to identify areas for further improvement and research in our critically ill patient population.

Methods: A new sedation protocol has been developed for use in St. Rita's Medical Center (SRMC) Intensive Care Unit (ICU). Implementation included necessary updates to existing order sets and education for staff. This study is designed to examine any difference in outcomes between the new protocol and the previous version. All research was conducted at SRMC. Data is to be collected via retrospective chart review with all patient identifiers removed. Demographic information to be collected includes age, sex, weight, diagnosis on admission, and past medical history significant for sedative use or substance abuse. Patients considered eligible include those admitted to the ICU with physician orders to follow the new sedation protocol. Patients will be excluded for age less than 18 years, pregnancy, moribund state (i.e., death was perceived to be imminent), withdrawal of life support, profound neurological deficits (e.g., large stroke or severe dementia) or current incarceration. An equal number of historical controls will be identified and analyzed. The primary outcome is ICU length of stay (LOS). Secondary outcomes include hospital LOS, length of mechanical ventilation, incidence of adverse events, self-removal of tubes or catheters, and scores for validated pain and agitation scales. The percent of patients for which the new protocol is utilized will also be determined.

Results: Data collection to commence upon approval of sedation protocol by the hospital forms committee.

Conclusions: Pending

Learning Objectives:
Identify medications commonly used for the sedation of critically ill patients. Describe the role of the Richmond Agitation-Sedation Scale in patient assessment.

Self Assessment Questions:
Which of the following medications has an FDA-indication for sedation?
A. Fentanyl
B. Midazolam
C. Lorazepam
D. Haloperidol

A sedated patient that only responds to physical stimulation would receive what score on the Richmond Agitation-Sedation Scale?
A. -2
B. -3
C. -4
D. -5

Q1 Answer: B  Q2 Answer: C

ACPE Universal Activity Number 121-999-11-340 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
CLINICAL COMPARISON OF POSACONAZOLE VS. FLUCONAZOLE PROPHYLAXIS IN PATIENTS WITH ACUTE MYELOGENOUS LEUKEMIA OR MYELODYSPLASTIC SYNDROME
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Purpose: Patients with acute myelogenous leukemia (AML) or myelodysplastic syndrome (MDS) receiving induction chemotherapy experience prolonged neutropenia, placing them at increased risk for invasive fungal infections. In 2007, posaconazole was found to be superior to fluconazole for fungal prophylaxis in these patients. However, posaconazole is available only as an oral suspension and has poor absorption if not taken with a high fat meal or supplement. In a real world clinical environment it may be difficult to ensure adequate nutritional intake to maximize the drugs absorption. The purpose of this study was to determine if posaconazole, as compared with fluconazole, decreased the utilization of subsequent antifungal agents such as miconafungin, voriconazole, or amphotericin B. Secondary objectives will include time to first change of antifungal medication, antifungal-related adverse events, proven fungal infections, and mortality.

Methods: This project was approved by the Institutional Review Board of the University of Kentucky. A retrospective chart review was conducted to include patients diagnosed with AML or MDS undergoing induction chemotherapy and receiving antifungal prophylaxis with either fluconazole or posaconazole. Relevant data were collected on all applicable patients >18 years of age who were treated at University of Kentucky HealthCare, UK HealthCare, 800 Rose Street, H110, Lexington, KY, 40536July 1, 2009 and July 1, 2010. The primary outcome will be evaluated using logistic regression, patient demographics will be evaluated using the chi-squared test, and secondary outcomes will be evaluated using the student t-test, Wilcoxon Rank Sum Test, the Cox proportional hazard, and Kaplan Meier Curves.

Results: Results and conclusions to be presented at the Great Lakes Residency Conference.

Learning Objectives:
Identify how the use of posaconazole for antifungal prophylaxis affects total antifungal utility in patients undergoing induction chemotherapy for AML or MDS.
Describe the rationale for using posaconazole instead of fluconazole for antifungal prophylaxis.

Self Assessment Questions:
Which factor is most associated with low serum posaconazole levels?
A: Fasting
B: Fatty meals
C: Nutritional supplements
D: Fluid overload

Coverage of which fungal pathogens give posaconazole a theoretical advantage over fluconazole?
A: Cryptococcus neoformans
B: Histoplasma spp.
C: Aspergillus spp.
D: Candida albicans

Q1 Answer: A Q2 Answer: C

EVALUATING HIV PRIMARY CARE GUIDELINE ADHERENCE AND OUTCOMES FOR DYSLIPIDEMIA IN HENRY FORD HOSPITAL’S INFECTIOUS DISEASE CLINIC
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Purpose: HIV treatment and management has changed dramatically. Patients are living longer and fuller lives due to new and potent therapies. HIV in many patients can now be considered a chronic condition. While this is an excellent change from terminal, it is not without complications. Blood glucose abnormalities and dyslipidemia are two relatively common chronic concerns in patients. Both the HIV infection itself as well as its medical treatment can adversely affect these other co-morbid conditions. The HIV primary care guidelines are tailored specifically to this patient population to help control for the increased complications due to infection and the use of antiretrovirals. These guidelines utilize a significant amount of data garnered from a non-HIV+ population. By examining how the guidelines are being used we can assess efficacy in our clinic patients and as well as potential areas for improvements in care. This study will evaluate the use of established primary care guidelines in HIV+ patients at Henry Ford Hospitals Infectious Disease Clinic.

Methods: This study is retrospective cohort examining one year of follow-up data from HIV+ patients receiving medical care at Henry Ford Hospitals ID Clinic. Patients will be identified as having received medical care from March 1st 2009 through August 31st 2009. 100 patients will be identified using ICD9 codes specific to HIV+, having hyperlipidemia, and whether treatment was according to established guidelines. Patient demographics will be collected, as well as relevant disease state data for HIV, hyperlipidemia and diabetes. Standard univariate (e.g. Chi square, T-test) and multivariate (regression) techniques to determine association of guideline-driven therapy and other patient characteristics with improvement in lipid profile will be used.

Results:
Data collection is ongoing at the time of abstract submission

Learning Objectives:
Recognize disease states that have long term complications from HIV infections.
Identify appropriate hyperlipidemia therapy in a patient with HIV.

Self Assessment Questions:
HIV drug interactions often dictate the choice of statin for hyperlipidemia therapy. Which of the following statins is often not recommended due to potential drug interactions?
A: Atorvastatin
B: Lovastatin
C: Pravastatin
D: Fluvastatin

During the HIV disease course, several factors affect and complicate a patients chronic conditions. Which of the following is one of the proposed mechanisms of these factors?
A: NNRTI induced hyperglycemia
B: Protease inhibitor drug interactions with dylipidemia treatments
C: Integrase inhibitor induced insulin resistance
D: NRTI interaction with long acting insulin

Q1 Answer: B Q2 Answer: B

ACPE Universal Activity Number 121-999-11-357 -L02-P
Activity Type: Knowledge-based Contact Hours: 0.5
RELATION OF PATENT DUCTUS ARTERIOSUS CLOSURE TO CHANGE IN URINE OUTPUT IN NEONATES TREATED WITH INDOMETHACIN

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Background: Patent ductus arteriosus (PDA) is the failure of the ductus arteriosus to close after birth. Efficacy of indomethacin treatment is variable due to interpatient differences in pharmacokinetics. Decreased urine output, a known side effect of indomethacin, could be associated with high plasma levels of indomethacin. If a relationship between decreased urine output and PDA closure exists, urine output could serve as a surrogate measure for predicting PDA closure. The purpose of this study is to identify the relationship between changes in urine output and successful PDA closure in neonates treated with indomethacin.

Methods: This Institutional Review Board-approved retrospective study identified patients who received intravenous indomethacin in the neonatal intensive care unit from January 1, 2005 to October 1, 2010. Patients with congenital malformations incompatible with life, renal disease or anomalies, or chromosomal abnormalities were excluded. Each chart was reviewed for gestational age, birth weight, baseline urine output at initiation of therapy, dose of indomethacin, number of doses of indomethacin received, day of life at time of therapy, urine output between each dose of indomethacin, urine output 24 and 36 hours after completion of therapy, adverse events associated with therapy, size of the PDA, closure of PDA, and occurrence of repeat treatment or surgica ligation. Urine output over discrete time periods will be compared in neonates with PDA closure versus neonates without closure to identify the relationship of change in urine output to PDA closure. Secondary outcomes include overall closure rate, need for repeat therapy or surgical ligation, and incidence of adverse events associated with therapy.

Results: Eighty-nine patients were identified for chart review. Data collection and statistical analysis is ongoing. Final results will be presented at Great Lakes Residency Conference.

Learning Objectives:
- Explain role of prostaglandins in the neonatal kidney.
- List variables in the neonate that impact successful PDA closure.

Self Assessment Questions:
Which of the following is an effect of prostaglandins on the neonatal kidney?
A: Vasoconstriction of the efferent arteriole
B: Inhibit production of renin
C: Aid in regulation of renal growth
D: Promote production of aldosterone

Response to PDA treatment with indomethacin can be affected by which of the following?
A: Gestational age
B: Baseline serum creatinine
C: Baseline urine output
D: Apgar scores

Q1 Answer: C Q2 Answer: A

ACPE Universal Activity Number 121-999-11-174 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

ASSESSMENT OF ACCURACY AND SAFETY OF A VANCOMYCIN DOSING PROTOCOL

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Purpose: Pharmacists at Indiana University Health at Methodist Hospital are consulted to dose and monitor vancomycin for inpatients. Pharmacokinetic equations are used to estimate volume of distribution and clearance of vancomycin, but no standard dosing protocol currently exists. The objective of this study was to determine the accuracy and safety of a standardized vancomycin dosing protocol designed to target trough concentrations 15 - 20mg/L in adults compared to current individualized pharmacist practice.

Methods: A retrospective electronic chart review was performed on patients of Indiana University Health at Methodist Hospital, Indianapolis Indiana. Study subjects were patients at least 18 years of age for whom pharmacy was consulted to dose vancomycin between July 1, 2010 and December 31, 2010. Steady-state vancomycin trough concentrations were compared for patients on whom the standardized protocol was used vs. a control group of patients who retrieved individualized pharmacist dosing. Exclusion criteria were as follows: diagnosis para- or quadriplegia, received vancomycin within two days prior to admission, actual body weight less than calculated ideal body weight, calculated dosing weight less than 45kg or greater than 154kg, severe renal dysfunction or rapidly changing renal function within 2 days prior to first dose vancomycin or before reaching steady state. The primary outcome was the frequency of resulted vancomycin trough concentrations ≤ 9.9mg/L, 10 - 14.9mg/L, 15 - 20mg/L, or ≥ 20.1mg/L. Safety was evaluated as a secondary outcome by incidence of nephrotoxicity (increase of 0.5 mg/dL or 50% or more of baseline serum creatinine level in 2 consecutive laboratory tests).

Results/Conclusion: Results and conclusion will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
- Identify six infectious indications for which The American Society of Health-System Pharmacists, the Infectious Diseases Society of America and the Society of Infectious Diseases Pharmacist recommends targeting vancomycin trough concentrations 15 - 20mg/L.
- Explain the reasoning behind the IDSA recommendation of targeting vancomycin trough concentrations 15 - 20mg/L.

Self Assessment Questions:
1. Which of the following statements concerning the IDSA recommendation of targeting vancomycin trough concentrations 15 - 20mg/L is true?
   A: It is only recommended to treat infections cause by MRSA that have vancomycin MIC ≤ 1
   B: Achieving trough concentrations 15 – 20mg/L will ensure 80% peak trough
   C: It is based on a targeted AUC:MIC greater than 600 if the MIC ≤ 1.
   D: It is recommended to treat bacteremia, infective endocarditis, oste

Concerning vancomycin pharmacokinetics and pharmacodynamics, which of the following statements is true?
A: Penetration into the lungs has been measured 75 to 85% of serum
B: The pharmacokinetic parameter which has been found to correlate
C: Vancomycin is considered a concentration dependent killer
D: Central nervous system penetration is excellent unless meninges

Q1 Answer: D Q2 Answer: B

ACPE Universal Activity Number 121-999-11-436 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5
EVALUATING THE SUCCESS OF A PHARMACIST-RUN LIPID CLINIC IN A VETERAN POPULATION

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Purpose: Studies have shown that pharmacists are able to effectively manage lipid disorders and achieve LDL cholesterol target levels as defined by the National Cholesterol Education Program Adult Treatment Panel III Guidelines. Despite these guidelines, not all patients reach target LDL cholesterol levels. When the recommended lipid targets are unachievable, the goal of treatment is to optimize medication therapy. Many of the veterans enrolled in the pharmacist-run lipid clinic at the Ann Arbor Veterans Affairs Medical Center (VAMC) have a history of multiple medication intolerances, persistent hyperlipidemia despite combination therapy, or resistant hypertriglyceridemia. The primary objective of this study was to determine the average percent change in lipid levels of patients enrolled in a pharmacist-run lipid clinic. Secondary objectives included determining the percentage of patients who achieve the recommended lipid targets, determining the percentage of patients who maintain the lipid panel results they had at discharge from the clinic, determining the average duration of enrollment in the clinic, and assessing the incidence of lipid-modifying medication intolerances.

Methods: This retrospective chart review included patients who were referred to a pharmacist for lipid management at the Ann Arbor VAMC and who had at least two encounters with a pharmacist between January 2007 and August 2010. Patients who had fewer than two encounters with a pharmacist and patients whose providers requested a recommendation but not a referral were excluded from the study. Data collected included demographics, social history, diagnoses, relevant medication history, labs, dates of enrollment and discharge from the clinic, reason for referral to the clinic, and number of clinic visits. A two-tailed, paired t-test was used to assess the primary objective. Secondary objectives and other data were evaluated using descriptive statistics.

Results/Conclusion: Results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Review the NCEP ATP III Guidelines for the management of dyslipidemia.
List the most common side effects of lipid-modifying medications.

Self Assessment Questions:

DF is an 81 YOM with diabetes who presents to clinic for lipid management. Based on his most recent lipid panel (LDL = 70, HDL = 32, TG = 325, TC= 167), what is the target of therapy?
A: LDL cholesterol
B: HDL cholesterol
C: Triglycerides
D: Non-HDL cholesterol

What is the most common side effect of HMG-CoA reductase inhibitors?
A: Flushing
B: Myalgias
C: Gastrointestinal toxicity
D: Renal toxicity

Q1 Answer: D Q2 Answer: B

ACPE Universal Activity Number 121-999-11-057 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

IMPACT OF PHYSICIAN EDUCATION ON IMPROVING ANTICOAGULATION OUTCOMES

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Background/Purpose: A retrospective review of patients initiated on warfarin therapy has previously been conducted. Fifty patients in whom warfarin was initiated and dosed by the pharmacy consult service were compared with fifty patients in whom warfarin was initiated and dosed by physicians. A statistically significant difference in time to therapeutic INR was identified between the physician and pharmacist initiation of warfarin (5.0 versus 5.7 days, P=0.029). Additionally, the pharmacists were more consistent in the time to reach therapeutic INR, whereas the physician group showed more variability, with 0.5 days and 2 days difference, respectively, between aggressive and conservative dosing strategies. To more closely align the anticoagulation outcomes achieved by the pharmacists and the physicians, the physicians will be familiarized with the pharmacy warfarin initiation nomogram. This study will evaluate the impact of educating the physicians and pharmacists on the pharmacy warfarin initiation nomogram as it relates to time to therapeutic INR, occurrence of INR>5, and obtaining a baseline INR.

Methods: This study will be submitted for review by the Institutional Review Board (IRB). Data previously collected on the safety and efficacy of the dosing nomogram will be presented to the pharmacists and physicians. Hemorrhagic risk factors associated with INR>5 and strategies for reducing INR>5 will be discussed, and the initiation nomogram utilized by pharmacy will be provided to the physicians. Patient cases involving an INR>5 will be compared in the 2 months prior and 2 months following physician education. Results will be used to determine the impact of physician and pharmacist education on the following outcomes: time to therapeutic INR in warfarin-naive patients requiring anticoagulation, percentage of warfarin dosing completed by the pharmacy consult service, collection of baseline INR, and occurrences of INR>5.

Results/Conclusion: Results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Discuss trends among cases of INR>5 and examine the impact of physician and pharmacist education on improving patient safety outcomes related to anticoagulation.

Self Assessment Questions:

Based on data from Riverside Methodist Hospital, which hemorrhagic risk factor was most frequently associated with cases of INR>5?
A: Age>75
B: History of stroke
C: History of gastrointestinal bleeding
D: Alcoholism
T or F: When managed by the pharmacy consult service, patients reached therapeutic INR 0.7 days sooner than when warfarin was dosed by the physicians.
A: True
B: False, physicians reached therapeutic INR on average, sooner than the pharmacists
C: False, there was no statistical difference in time to therapeutic INR
D: False, the pharmacists reached therapeutic INR 2.0 days sooner than the physicians.

Q1 Answer: A Q2 Answer: A

ACPE Universal Activity Number 121-999-11-090 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
EVALUATING OUTCOMES AND FINANCIAL JUSTIFICATION OF THE NEWLY IMPLEMENTED PROJECT PRIMED (PHARMACIST RECONCILIATION AND MEDICATION EDUCATION AT DISCHARGE)

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Purpose: The primary objectives of this newly implemented, quality improvement project PRIMED (Pharmacist Reconciliation and Medication Education at Discharge) are to: 1) improve patient safety by demonstrating that pharmacists can reduce medication errors at discharge, 2) improve patient compliance by facilitating the outpatient prescription acquisition process, and 3) have future positions financially justified by offsetting costs with retail prescription volume growth.

Methods: The current study is a retrospective, single-center, quality improvement project, evaluating the effect of pharmacist medication reconciliation and patient education during hospital discharge at an academic medical center. Project PRIMED was implemented on 9/7/10, and data was collected and analyzed through 12/31/10.

Results: Two full-time pharmacists covering 119 beds on two general medical and two surgical floors had a reconciliation encounter with 825 patients. Fifty-two percent of patients required at least one intervention due to potential medication errors at hospital discharge. There were a total of 661 interventions; 46% potentially avoided patient harm according to the NCC MERP Index for categorizing medication error algorithm. The most common type of intervention involved a dispensing/dosage error (40%). Pharmacists intervened most often on antimicrobial medications (15%). The prescriber agreed with the pharmacists’ detection of error 78% of the time, and subsequently accepted their recommendations 90% of the time.

The retail prescription capture rate upon hospital discharge tripled from 9% to 27% on the intervention floors, which allowed for a projected $192,145 in additional annual prescription revenue. The projected annual cost avoidance associated with a reduction in medication errors totaled over $1.1 million for the intervention floors.

Conclusion: Pharmacist medication reconciliation at hospital discharge considerably reduces preventable medication errors. Additionally, pharmacists educating patients on their new medication regimen and facilitating the outpatient prescription acquisition process can improve patient compliance and increase a hospitals retail prescription volume.

Learning Objectives:
Identify the tool used to categorize the medication errors that were potentially avoided by the pharmacists' interventions, and list some examples.
Describe two ways in which Froedtert Hospital plans to financially justify additional discharge pharmacist FTEs.

Self Assessment Questions:
1) What percentage of patients with a discharge pharmacist encounter required at least one intervention due to a potential medication error?
   A: 20%
   B: 30%
   C: 40%
   D: >50%
2) Prior to Project PRIMED, only 9% of patients filled prescriptions at Froedtert's outpatient pharmacies upon hospital discharge. What percentage of patients with a discharge pharmacist encounter, an
   A: 27%
   B: 40%
   C: 60%
   D: 78%

EVALUATION OF OUTCOMES AND ADVERSE EFFECTS WHEN ADMINISTERING ALTERNATIVE DOSES OF LINEZOLID TO OBESE PATIENTS

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PURPOSE: Obesity is recognized by the World Health Organization (WHO) as a global pandemic. As the prevalence of obesity continues to rise, it becomes increasingly important to explore optimal dosing of antimicrobials for treating infections in these patients. Patients who are obese have increased risk of morbidity and mortality associated with infection compared to patients who are not obese. Altered volumes of distribution and clearance may lead to sub-therapeutic concentrations of antimicrobials and be a contributing factor to the increase in failure rates. Limited data are available pertaining to antimicrobial dosing in this patient population, particularly with antimicrobials that are not dosed based on weight, such as linezolid. The maximum FDA approved dose of linezolid is 600mg IV/PO Q12hr for adults; however, results from pharmacokinetic monitoring suggest that higher doses may be needed to achieve adequate exposure in obese patients. When using higher doses, patient outcomes and safety should be evaluated.

METHODS: This study is a retrospective chart review to evaluate outcomes and safety for all patients that received alternative doses of linezolid at St. Francis Hospitals from January 1, 2004 to December 31, 2010. During the study period, forty-three patients received linezolid at higher doses than 600mg IV/PO Q12hr. Patients in the study control group, which received FDA-approved doses of linezolid, will be case-matched with the study group based on age, indication, route of administration, and length of therapy during the same study period. The primary outcomes will be clinical outcome and adverse effects.

RESULTS: Data collection is in progress. Preliminary results will be presented at the Great Lakes Residency Conference.

Learning Objectives:
Identify the impact of administering higher doses of linezolid on clinical outcomes in obese patients.
Describe safety of administering higher doses of linezolid in obese patients.

Self Assessment Questions:
What pharmacodynamic parameter best characterizes bactericidal activity of linezolid?
A: Time above the minimum inhibitory concentration (T>MIC)
B: Ratio of concentration to minimum inhibitory concentration (Cmax: MIC)
C: Area under the curve to minimum inhibitory concentration ratio (AUC: MIC)
D: Both A and C

What percent of adult patients treated with linezolid in Phase III, comparator-controlled trials developed thrombocytopenia (defined as less than 75% of the lower limit of normal and/or baseline)?
A: 2.4%
B: 5.6%
C: 10.8%
D: 20.3%

Q1 Answer: D Q2 Answer: A

ACPE Universal Activity Number 121-999-11-493-L05-P
Activity Type: Knowledge-based Contact Hours: 0.5
EVALUATION OF THE ASSOCIATION BETWEEN HEMOGLOBIN A1C AND DEEP STERNAL WOUND INFECTIONS IN DIABETIC PATIENTS UNDERGOING ELECTIVE CARDIOTHORACIC SURGERY

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In the surgical candidates undergoing elective cardiothoracic surgery, the prevalence of diabetes is increasing. According to the American Diabetes Association (ADA) the recommended glycated hemoglobin concentration is less than 7 percent; while the American College of Endocrinology (ACE) and American Association of Clinical Endocrinologists (AACE) recommend a glycated hemoglobin concentration of less than 6.5 percent. Patients diagnosed with diabetes mellitus are at increased risk of postoperative complications including deep sternal wound infections. Studies have demonstrated a positive correlation between the peri-operative blood glucose concentration and the incidence of deep sternal wound infections.

At the University of Michigan Hospitals and Health Centers, there is no protocol to ensure the optimization of the patients glycated hemoglobin A1C prior to presenting for elective cardiothoracic surgery. The purpose of this study is to define the need for optimizing a patients glycated hemoglobin A1C prior to elective cardiovascular surgery by determining a possible correlation between glycated hemoglobin A1C concentrations and the incidence of deep sternal wound infections in the population diagnosed with diabetes.

This retrospective, single-center, observational cohort study will consist of all adult patients (age greater than or equal to 18 years of age) admitted to the University of Michigan Hospitals from January 1, 2005 to December 31, 2009 who underwent elective cardiothoracic surgery. Included patients will have a preoperative diagnosis of diabetes mellitus and glycated hemoglobin A1C. Patients will then be stratified into one of three groups based on their pre-operative hemoglobin A1C concentration. The well controlled group will have a pre-operative A1C concentration less than 7.0 mg/dL, the intermediate group will have a preoperative A1C from 7.0 mg/dL to 8.5 mg/dL, including the values, and the poor control group will have an A1C concentration greater than 8.5 mg/dL.

Learning Objectives:
Discuss the definition of a deep sternal wound infection.
Explain the possible association between hemoglobin A1C and deep sternal wound infections in diabetic patients undergoing elective cardiothoracic surgery.

Self Assessment Questions:
Which of the following statements would be sufficient for a diagnosis of deep sternal wound infection?
A: An organism isolated from a culture of mediastinal tissue or fluid
B: Chest pain without purulent discharge from the mediastinum
C: Sternal instability alone
D: A patient who presents with a fever following open heart surgery

Based on the published literature, which of the following statements is true?
A: There is an inverse correlation between glycated hemoglobin A1C and deep sternal wound infections in diabetic patients undergoing elective cardiothoracic surgery.
B: There is no correlation between glycated hemoglobin A1C and deep sternal wound infections in diabetic patients undergoing elective cardiothoracic surgery.
C: There is a positive correlation between glycated hemoglobin A1C and deep sternal wound infections in diabetic patients undergoing elective cardiothoracic surgery.
D: There are no studies published correlating glycated hemoglobin A1C and deep sternal wound infections in diabetic patients undergoing elective cardiothoracic surgery.

Q1 Answer: A  Q2 Answer: C

VANCOMYCIN THERAPY IN PEDIATRIC PATIENTS

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Purpose: Vancomycin is a glycopeptide antibiotic used in the treatment of proven or suspected infections with gram positive organisms. Increased use of vancomycin has led to vancomycin resistance (VISA) and vancomycin resistant (VRE) strains of Staphylococcus aureus. In addition, it has contributed to an increased occurrence of vancomycin resistant enterococcal (VRE) colonization and infection. As a result, Children's Hospital of Wisconsin (CHW) is committed to establishing an antimicrobial stewardship program which would monitor the appropriate use of antimicrobials. With over 1,400 doses of vancomycin administered each month, evaluation of current practices is desired in order to revise existing appropriate use guidelines for vancomycin at CHW. The primary objective of this study is to update CHWs guidelines for the appropriate use of vancomycin in pediatric patients and to evaluate adherence following implementation.

Methods: A literature review was conducted in order to determine current practice standards for the use of vancomycin in pediatric patients. All pediatric patients receiving vancomycin at CHW from August 27, 2010 to September 27, 2010 were included in the retrospective portion of this study. Retrospective data was gathered from the patient medical record, the pharmacy's GE Centricity and CHWs ChartMaxx. Data collected includes: patient demographics (weight, age, allergies, concomitant disease states), duration of therapy, microbiology results, reason for use, concomitant antibiotics, laboratory data (WBC, BUN, Scr), and whether use follows existing guidelines. After updated guidelines for appropriate use of vancomycin are implemented, the same data from above will be collected on all pediatric patients started on vancomycin during the prospective surveillance.

Results/Conclusions: Implementation and data collection is in progress. Available results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Recognize the consequences of inappropriate vancomycin use.
List appropriate uses for vancomycin in pediatric patients.

Self Assessment Questions:
What are potential consequences of vancomycin overuse in pediatric patients?
A: Increased incidence of vancomycin resistant enterococcal coloni
B: Increased occurrence of vancomycin resistant Enterococcal coloni
C: Increased occurrence of vancomycin resistant Enterococcal infection
D: All of the above

Which of the following is an appropriate indication for initial vancomycin use in the pediatric population?
A: Treatment of MRSA colonization
B: Empiric treatment for a suspected gram-positive CVL infection
C: Routine gastrointestinal surgical prophylaxis
D: Treatment of a proven gram negative sepsis

Q1 Answer: D  Q2 Answer: B
EVALUATION OF PROCESS TO DISCONTINUE STRESS ULCER PROPHYLAXIS UPON STEP DOWN FROM A CRITICAL CARE AREA

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Background:
Patients in the Intensive Care Unit (ICU) are at higher risk for development of stress ulcers; causes include non-eating status, mechanical ventilation, and higher stress on the body. Usual prophylaxis for these patients is either a proton pump inhibitor (PPI) or histamine 2 (H2) receptor blocker. Often, once patients have recovered and are transferred out of the ICU, stress ulcer prophylaxis is inappropriately and patients may be discharged on these agents. With recent literature showing that prolonged use of PPI can result in increased risk of fractures and Clostridium difficile infections, it is important to discontinue these medications as soon as medically possible.

Purpose:
The primary objective of this study is to determine the incidence of continuation of stress ulcer prophylaxis. Secondary objectives will focus on the appropriate use of PPIs for stress ulcer prophylaxis.

Methods:
This study has been submitted to the IRB for approval. Patients will be included if they are admitted to an Intensive Care Unit between February 1, 2010 and March 30, 2011. Excluded patients will be those < 18 years of age, those that are pregnant during admission, and those on a home regimen of proton pump inhibitors. An evaluation of patients receiving proton pump inhibitors while in the ICU and those that continue them upon transfer off the unit will be included in this study. Baseline demographics that will be collected include: location, acid suppressant therapy, nutrition status, ventilatory status, and diagnoses. A Pharmacy and Therapeutics policy will be developed allowing pharmacy staff to discontinue PPIs if specific criteria is met. After the policy is in place, the same demographics will be evaluated.

Results:
In Progress

Learning Objectives:
Define risk factors associated with stress ulcers.
Recognize methods to reduce the usage of proton pump inhibitors for stress ulcer prophylaxis.

Self Assessment Questions:
Which of the following are considered risk factors for development of stress ulcers?
- A: Mechanical Ventilation
- B: NPO status
- C: Coagulopathy
- D: Two of the above

Strategies to minimize use of proton pump inhibitors include:
- A: Prevention of initiation unless risk factors are met
- B: Discontinuation of proton pump inhibitors after critical care discharge
- C: None of the above
- D: Two of the above

Q1 Answer: D Q2 Answer: D

EFFECTS OF IMPROVED STANDARDIZED SUBCUTANEOUS INSULIN ORDER SET UTILIZATION ON GLYCEMIC CONTROL IN NON-CRITICALLY ILL PATIENTS

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Improved glycemic control is associated with decreased patient morbidity, mortality, length of stay, and reduced hospital costs. The glycemic goal for non-critically ill patients is to maintain random blood glucose levels below 180 mg/dL while avoiding hypoglycemia. This may be accomplished by utilizing a regimen of basal insulin and nutritional support. Standardized subcutaneous insulin order sets and insulin management protocols have been advocated as a method to promote basal bolus regimen and improve glycemic control. The objective of this study was to prospectively evaluate glycemic control and insulin use patterns in patient populations who received subcutaneous insulin with and without a standard protocol.

Two telemetry units were selected as "model units" for evaluation of glycemic outcomes before and after implementation of an educational program supporting the use of a standardized insulin protocol. The subcutaneous insulin protocol was implemented through newsletters, informational packets, and inservices that illustrated the best practice of glycemic control, insulin management, and major concepts driving the protocol. Patients were included in the study if they were admitted to a telemetry floor, had received subcutaneous insulin, and were monitored by point-of-care serum glucose checks. Patients were excluded if they did not fulfill the inclusion criteria, were less than 18 years old, or were on insulin-pump therapy. Data collection included patient demographics, hyperglycemic events (serum glucose ≥ 180 mg/dL), hypoglycemic events (serum glucose < 70 mg/dL), order set use, insulin regimen, and insulin type. Outcomes include incidence of hyperglycemia, incidence of hypoglycemia, order set use, and insulin use patterns. Statistical analyses will be performed using t-test for continuous data, Chi-squared or Wilcoxon-Rank Sum as appropriate for number of data points for categorical data.

Data collection is currently pending. Results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Describe the different pharmacokinetic profiles of insulin.
Discuss different glycemic management strategies in non-critically ill patients.

Self Assessment Questions:
Which of the following is considered to be a long-acting insulin?
- A: Regular insulin
- B: Insulin aspart
- C: Insulin detemir
- D: Insulin lispro

In general, which of the following is a preferred strategy for optimizing glycemic control in non-critically ill patients?
- A: Prolonged therapy with "sliding scale" insulin alone
- B: Scheduled subcutaneous insulin with basal, correctional and nutrition
- C: Scheduled basal insulin alone
- D: Oral anti-diabetic medications

Q1 Answer: C Q2 Answer: B

Activity Type: Knowledge-based Contact Hours: 0.5
EVALUATION OF VIRTUAL PATIENT CASES IN A PSYCHIATRY ELECTIVE SEMINAR COURSE

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Purpose:
Virtual patients are used to mimic patient care scenarios in a safe learning environment. Virtual patient cases can also be used to expose students to rare clinical pictures that are unlikely to be observed during clerkship experiences. This type of instruction is thought to increase efficiency, consistency of instruction, and problem-solving skills development; however, little research has been conducted on the use of virtual patient cases in pharmacy education. This study will evaluate the use of virtual patient cases compared to traditional paper cases in pharmacy education in a pharmacy psychiatric seminar. It is hypothesized that students will score higher on knowledge and confidence assessments in topic areas related to their assigned virtual patient case as compared to topic areas taught by traditional methods.

Methods:
All students enrolled in the University of Wisconsin-Madison School of Pharmacy Seminars in Psychiatry course were invited to participate in the study. Students were assigned one of four longitudinal virtual patient cases; each case focuses on different disease states. Study participants completed a pre-evaluation at the beginning of the semester and will complete a post-evaluation at the end of the semester. These evaluations consist of knowledge and confidence assessments which focus on common psychiatric conditions. Pre and post responses will be assessed for overall changes and differences based on which virtual patient case the student was assigned. The post evaluation will also elicit student preferences for the use of virtual patient cases versus traditional paper patient cases. Additionally, students will be asked to complete short weekly evaluations after each designated class period which will be used to determine trends in student learning preferences regarding virtual patient cases.

Results:
Pending

Conclusions:
Pending

Learning Objectives:
State 3 potential benefits of virtual patient cases in pharmacy education.
Describe how virtual patient cases can be implemented in an elective seminar course setting.

Self Assessment Questions:
Which of the following statements is true regarding the use of virtual patient cases?
A Virtual patient cases are not helpful in mimicking rare experiences
B Virtual patient cases are thought to decrease consistency of instruction
C The use of virtual patient cases has been studied extensively in psychiatry
D Virtual patient cases provide a safe learning environment for students

Which of the following is true about the implementation of virtual patient cases in a pharmacy elective setting?
A The type of computer software available at an institution should not affect the quality of instruction
B Assigning students to follow a longitudinal virtual patient case can provide a more consistent learning experience
C Each student must receive the same case as their classmates to avoid different experiences
D Virtual patient cases are better than traditional methods of instructing students

Q1 Answer: D Q2 Answer: A

ACPE Universal Activity Number 121-999-11-386 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5
ANALYSIS OF DISPARITIES IN THE INCIDENCE OF MEDICATION PRESCRIBING ERRORS
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Purpose: Medication safety and elimination of health care disparities are both major topics of interest to national healthcare organizations such as the Institute of Medicine (IOM), the American Society of Health Systems Pharmacists, and the Department of Health and Human Services. It is proposed that 5.3% of inpatient medication orders contain at least one error. The IOM stated that “evidence of racial and ethnic disparities in healthcare are remarkably consistent across a range of illnesses and healthcare services.” It is unknown whether certain patient populations are more prone to medication prescribing errors. To our knowledge, there has not yet been a published study that has attempted to identify an association between medication prescribing errors and these patient characteristics. The objectives of this study are to evaluate the association between age, gender, socioeconomic, and racial/ethnic characteristics and the incidence of medication prescribing errors as well as to characterize the medication errors that occur.

Methods: This is a retrospective observational cohort study. Data were obtained from electronic medical record review. Two hundred patients were randomly selected from all inpatients at Henry Ford Hospital between January 1, 2010 and July 1, 2010. Demographic and clinical characteristic data were collected for each patient from various hospital databases. Medication prescribing errors were identified through review of all medication orders within the first 24 hours of inpatient admission. Errors were identified using the investigators clinical judgment and comparison against a standard reference. Subsequent review of all identified medication errors by a panel of clinical pharmacy specialists served as further validation. Statistical analysis will include univariate and multivariate analyses and descriptive statistics.

Results/Conclusions: To be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Recognize that disparities may be present in the incidence of medication errors and how disparities may affect patient care.
Describe common types of prescribing errors, the medications frequently involved, and how pharmacists can potentially decrease disparities.

Self Assessment Questions:
Medication errors
A are not a major cause of adverse drug events.
B: have the potential to increase length of stay, re-admission rate, health disparities
C: occur at a rate of 0.5-1 per 100 inpatient orders.
D: can be divided into errors of commission and errors of omission.

Health disparities
A are not considered within the realm of pharmacy practice.
B: not currently a major concern to several national healthcare organizations.
C: refer only to the ability of patients to pay for medical procedures.
D: can be decreased significantly by pharmacists through enhancing patient care.

Q1 Answer: B Q2 Answer: D

ACPE Universal Activity Number 121-999-11-469 -L05-P
Activity Type: Knowledge-based Contact Hours: 0.5

THE SAFETY AND EFFICACY OF VALPROIC ACID OR OXCARBAZEPINE FOR DEMENTIA-RELATED AGITATION
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Background: Antipsychotic medications have commonly been used off-label for the treatment of dementia associated agitation. Recent data shows typical and atypical antipsychotics increase mortality, in this patient population, in a dose related fashion. Antipsychotics hold a black box warning stating that using antipsychotics for dementia-related psychosis can increase mortality. The use of valproic acid and oxcarbazepine to treat these patients has increased since the black box warning was released; however, the efficacy and safety of these medications is uncertain in this population.

Purpose: To determine the efficacy and safety of valproic acid or oxcarbazepine for the treatment of dementia-related agitation.

Methods: This retrospective case matched chart review evaluates the use of oxcarbazepine and valproic acid use in dementia-related agitator patients admitted to St. Thomas Hospitals geropsychiatric inpatient unit between 2006 and 2010. Cases are defined as patients started on either valproic acid or oxcarbazepine to treat dementia-related agitation and controls are patients treated with a scheduled antipsychotic. Matching was based on demographics, use of memantine, and type of dementia. Data will be compared between cases and controls and between patients on valproic acid and oxcarbazepine. Twenty-nine cases were found and matched with controls; twenty valproic acid and nine oxcarbazepine patients. The primary outcome measure is the amount of antipsychotic medication (in haloperidol equivalents) used to treat dementia related agitation in patients on valproic acid or oxcarbazepine compared to those on scheduled antipsychotic medications. Secondary outcomes include length of stay, readmission to St. Thomas or Akron City Hospitals within 30 days, continuation of valproic acid or oxcarbazepine upon discharge, as well as the occurrence of hyponatremia, hyperammonemia, and thrombocytopenia. Continuous data will be analyzed using analysis of variance and nominal data will be analyzed using the Chi squared test.

Results: Results and conclusions to be presented at Great Lakes Residency Conference.

Learning Objectives:
Recognize the potential risks of using antipsychotic medications to treat dementia-related agitation.
Review the current literature evaluating the efficacy and safety of valproic acid or oxcarbazepine for dementia-related agitation.

Self Assessment Questions:
Which of the following is correct?
A: Antipsychotics used to treat patients with dementia-related agitatic
B: The use of antipsychotics to treat dementia-related agitation has d
C: c. Only typical antipsychotics have shown an increased mortality
D: The use of antipsychotics to treat dementia-related agitation has d

Which of the following is correct?
A: Oxcarbazepine has an FDA approved indication to treat dementia-
B: Current literature consistently demonstrates that oxcarbazepine is
C: Valproic acid has an FDA approved indication to treat dementia-re
D: Current literature does not consistently demonstrate that valproic i

Q1 Answer: A Q2 Answer: D

ACPE Universal Activity Number 121-999-11-148 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
IMPROVING STRESS ULCER PROPHYLAXIS PRESCRIBING AND TIMELY DISCONTINUATION

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Background: Guidelines for the appropriate use of stress ulcer prophylaxis (SUP) were published in 1999 by ASHP. Additional literature shows inappropriate continuation of SUP is associated with an increased risk of osteoporosis, community acquired pneumonia, and Clostridium difficile infection, as well as increased cost. The purpose of this study is to assess the appropriateness of the addition and discontinuation of SUP at Franciscan Saint Margaret Health.

Methods: A retrospective chart review was performed. Patients were included if they were 18 years of age or older admitted to the ICU from January to June 2010 and excluded if they expired or were indicated for long term acid suppression. Indications were deemed appropriate if they followed the ASHP guidelines. The primary objective was to evaluate the appropriateness of SUP utilization. Secondary objectives were to assess the utilization of the existing ICU SUP protocol and identify the direct cost of inappropriate therapy.

Results: Of the 50 patients reviewed, 31 (62%) were male, average age was 66 years (range 26-90), and average ICU length of stay was 5 days (range 1-14). Of the 12 patients that met SUP criteria; 1 patient did not receive therapy and 6 were continued on therapy after risk subsided. Thirty-five (70%) patients had the SUP standing order in their charts and 5 of these were incomplete. Twenty three patients not meeting criteria were initiated on SUP leading to a direct cost of $220. Five (13.5%) patients were discharged on inappropriate therapy.

Conclusion: A majority of patients were initiated on SUP when it was not indicated or did not have SUP discontinued when risk factors changed. Recommendations were made to increase utilization of the existing SUP standing order, provide education, and expand SUP interventions to the medical and surgical floors. Final results will be presented at GLPRC.

Learning Objectives:
Define the concerns of inappropriate stress ulcer prophylaxis use.
Identify the appropriate risk factors for initiating stress ulcer prophylaxis in the ICU setting.

Self Assessment Questions:
The stress ulcer prophylactic agent should be discontinued:
A: When the patient is discharged from the hospital
B: When the risk factor(s) subside
C: When the patient starts to improve
D: When patient is transferred to a general medical floor
Which of the following is an ASHP risk factor for the use of stress ulcer prophylaxis
A: Admission to the ICU
B: Mechanical ventilation for > or = 48 hours
C: Sepsis
D: Age > 75
Q1 Answer: B  Q2 Answer: B

IMPLEMENTATION AND EVALUATION OF A TOBACCO CESSATION PROGRAM IN AN OUTPATIENT ONCOLOGY CLINIC

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Purpose:
Tobacco use is the leading preventable cause of premature death in the United States and causes approximately 435,000 deaths each year. Tobacco use has a causal link to lung, head and neck, pancreatic, bladder, kidney, stomach, uterine, and cervical cancers. There is evidence that continued tobacco use after the diagnosis of cancer decreases survival, reduces treatment efficacy, prolongs/increases treatment toxicity, and increases the risk for recurrence. Despite this evidence, it is reported that 23-35% of head and neck and 13-20% of lung cancer patients continue to smoke after diagnosis. The Clinical Practice Guidelines for Treating Tobacco Use and Dependence recommend using the time of cancer diagnosis as a “teachable moment for tobacco cessation. The combination of support from trained professionals and the use of medications increase the chances of quitting successfully. There is a paucity of data on the impact of a tobacco cessation program integrated into a cancer center. Because of the proven benefits of tobacco cessation and the lack of published research in the oncology area, the objective of this project is to implement and evaluate a tobacco cessation program in the Kellogg Cancer Centers (KCC).

Methods:
A multidisciplinary group at the KCC was established to oversee the development and implementation of the program including: pharmacist training to become a certified Tobacco Treatment Specialist, development of a policy and procedure facilitating the pharmacist to provide tobacco cessation services under the auspices of a designated physician, and oversight and establishment of an electronic medical record (EMR) documentation tool. The EMR documentation tool will help the pharmacist manage tobacco cessation for patients and aid in future research. Data will be collected using the new EMR documentation tool to determine tobacco abstinence rates and effectiveness of tailored interventions.

Results/Conclusion:
Results and conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:
Describe three key services necessary to establish a tobacco cessation program.
Discuss the most effective types of tobacco cessation treatment.

Self Assessment Questions:
Which of the following tobacco cessation therapies has been shown to be most effective?
A: Nicotine patch
B: Nortriptyline
C: Bupropion
D: Nicotine patch + Bupropion
What one of the following statements is correct?
A: Because cigar smokers do not typically inhale, they are not at an increased risk for cancer compared to cigarette smokers
B: Cigarette smoke is a mixture of 4,000 chemicals and over 60 known carcinogens
C: Tobacco cessation causes a rapid decline in risk for pancreatic cancer
D: The risk of cancer death is the same for light and heavy smokers.
Q1 Answer: D  Q2 Answer: C

ACPE Universal Activity Number 121-999-11-364-L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
ASSESSMENT OF ANTICOAGULATION KNOWLEDGE IN PATIENTS WHO HAVE UNDERGONE INITIAL WARFARIN EDUCATION
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Purpose: The objective of this program evaluation is to assess anticoagulation therapy knowledge among three pre-identified patient cohorts that are new to the VA Anticoagulation Clinic: patients initially educated during hospitalization at the VA, patients educated during an outpatient VA Anticoagulation Clinic visit, and patients educated prior to transfer into the VA Anticoagulation Clinic. The principle aim is to compare the scores of the Oral Anticoagulation Knowledge Test (OAK), a validated instrument to measure anticoagulation knowledge, among these three cohorts. The secondary aim is to identify potential factors contributing to anticoagulation knowledge deficiencies.

Methods: During routine clinic operations, Anticoagulation Clinic staff will identify patients who are new to the Anticoagulation Clinic who have already received initial warfarin education. Patients will be enrolled at a face-to-face Anticoagulation Clinic visit within four weeks following initial warfarin education. Patients with short-term (less than twelve weeks) warfarin therapy and prior use of warfarin in the last two years will be excluded from the evaluation. Baseline demographic data to be collected include: indication for warfarin, prior use of warfarin, highest level of education, preferred method of receiving health information, principle medication manager, and presence of dementia or depression. Anticoagulation staff will then administer and grade the Oral Anticoagulation Knowledge (OAK) test, review the answers with the patient, and provide further education if needed.

Results/Conclusions: Results and conclusions are pending and will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
List the domains of knowledge assessed by the Oral Anticoagulation Knowledge (OAK) Test.
Recognize patient characteristics that may contribute to anticoagulation knowledge deficiencies.

Self Assessment Questions:
The OAK test includes the following domains:
A Basic drug information, adverse effects, adherence, dietary issues
B Dietary issues, adverse effects, drug interactions, monitoring, basic
C Adherence, monitoring, contraindications, drug interactions, basic
D Monitoring, drug interactions, adverse effects, dietary issues, adhe

Demographic factors that may improve warfarin knowledge test scores include:
A Increasing age
B Lower family income
C Greater than 8th grade education level
D Unemployment

Q1 Answer: B Q2 Answer: C

ACPE Universal Activity Number 121-999-11-218 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

PHARMACODYNAMIC EVALUATION OF VANCOMYCIN DOsing IN THE TREATMENT OF METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS BACTEREMIA
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Due to escalating vancomycin minimum inhibitory concentrations (MICs) to methicillin-resistant Staphylococcus aureus (MRSA) isolates causing bacteremia, it is imperative that adequate vancomycin serum concentrations are obtained. Studies have demonstrated that MICs > 1 g/ml are associated with a more prolonged time to MRSA eradication and poor patient outcomes. Serum trough concentrations are easily measured and are potentially a surrogate marker for treatment success. Current recommendations are to obtain a vancomycin trough concentration of 15-20 g/ml in the treatment of MRSA bacteremia.

The most predictive marker of vancomycin efficacy and clinical success is the 24-hour area under the curve (AUC) to MIC ratio (AUC24:MIC). Studies have demonstrated an AUC24:MIC ratio > 400 g/ml is associated with improved clinical and microbiological outcomes. A recent study evaluated vancomycin in the treatment of ventilator associated pneumonia caused by MRSA. The study demonstrated that patients had a 76% clinical success rate when the AUC24:MIC ratio was > 345 g/ml and a 22% success rate if the AUC24:MIC ratio was ≤ 345 g/ml. It is predicted that similar results might be observed in patients with MRSA bacteremia.

The current study is a retrospective, single-center review evaluating the pharmacodynamics of vancomycin dosing in the treatment of MRSA bacteremia. All adult inpatients with a positive blood culture for MRSA and who received at least 3 doses of vancomycin between January 1, 2009 and December 31, 2009 will be included in the study. The primary outcome measure will compare microbiological cure between patients with vancomycin trough ≥ 15 g/ml and < 15 g/ml and patients with an AUC24:MIC ≥ 400 g/ml and < 400 g/ml. Secondary outcomes will evaluate the pharmacodynamics of vancomycin dosing with specific type MRSA strains.

Data collection and evaluation are currently being conducted and results will be presented at the conference.

Learning Objectives:
Recognize available treatment options for MRSA.
Identify the surrogate markers used to assess vancomycin efficacy and clinical and microbiological success.

Self Assessment Questions:
Which of the following medications is the drug of choice for MRSA bacteremia?
A Trimethoprim/sulfamethoxazole
B Vancomycin
C Clindamycin
D Nafcillin

Which marker is the most predictive of vancomycin efficacy?
A Serum peak concentration
B Serum trough concentration
C Minimum inhibitory concentration (MIC)
D Area under the curve (AUC) to MIC ratio (AUC24:MIC)

Q1 Answer: B Q2 Answer: D

ACPE Universal Activity Number 121-999-11-067 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
PILOT STUDY ON THE EFFICACY OF AN ONDANSETRON VERSUS PALONOSETRON-CONTAINING ANTIEMETIC REGIMEN PRIOR TO HIGHLY EMETOGENIC CHEMOTHERAPY

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Purpose: To determine the overall complete response rates (CR, no emesis and no use of rescue medication from 0 to 120 hours after chemotherapy) of ondansetron and palonosetron-containing antiemetic regimens for patients undergoing the first cycle of single day highly emetogenic chemotherapy (HEC).

Methods: This is a prospective, open label, stratified, randomized, single center pilot study. Inclusion criteria are: 18 to 89 years of age, confirmed malignancy, receiving first cycle of HEC (previous low/minimally emetogenic chemotherapy allowed), and an ECOG performance status of 0 to 2. Exclusion criteria are: grade 4 (metastatic) malignancy, any emetogenic chemotherapy allowed), and an ECOG performance status ≥ grade 2, or use of rescue antiemetics (except benzodiazepines) within 24 hours prior to HEC, liver dysfunction, and receiving clinically relevant strong CYP450 3A4 inducers and/or inhibitors. Patients are stratified based on chemotherapy regimen (cisplatin versus non-cisplatin) and are randomized to receive either palonosetron 0.25 mg IV OR ondansetron 24 mg orally on day 1 prior to HEC. All patients will receive aprepitant orally dosed as 125 mg on day 1, then 80 mg on days 2 and 3, and dexamethasone orally dosed as 12 mg on day 1, then 8 mg on days 2, 3, and 4. The primary endpoint is overall CR and will be evaluated using exact binomial methods to estimate proportions and their associated 95% confidence intervals. Secondary endpoints include acute (0 to 24hours) and delayed (24 to 120hours) CR, nausea and vomiting grade, and use of rescue medication and descriptive statistics will be generated.

Results: Patient enrollment and data collection are currently ongoing for this project. Results and conclusions are to be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Define the standard antiemetic regimen used for highly emetogenic chemotherapy.
Describe the differences between ondansetron and palonosetron and their potential impact on chemotherapy-induced nausea and vomiting.

Self Assessment Questions:
Which antiemetic(s) is/are most effective for the prevention of delayed nausea and vomiting?
A Ondansetron
B Aprepitant
C Dexamethasone
D b and c

How is palonosetron different from other 5HT3 antagonists?
A It has a longer half-life
B It is available as an intravenous product
C Has a higher binding affinity to the 5-HT3 receptor
D a and c

Q1 Answer: D Q2 Answer: D

EVALUATION OF TREATMENT OF OSTEOPENIA IN A VETERAN POPULATION

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Background: The National Osteoporosis Foundation (NOF) currently recommends consideration of prescription therapy for osteopenia in men ≥ 50 years old and postmenopausal women with a femoral neck or vertebral T-score between -1.0 to -2.5 in addition to a World Health Organization (WHO) adapted 10-year hip fracture probability of ≥ 3% or a 10-year non-hip fracture probability of ≥ 20%.

Methods: This study is a retrospective, electronic chart review of male and female patients aged 50 years and older at Jesse Brown VA Medical Center who completed a DEXA scan and who have been diagnosed with osteopenia. Information regarding demographics, laboratory values, DEXA T-scores, and medical interventions was extracted during the study period (defined as the date of DEXA showing osteopenia and January 1, 2009 and January 1, 2009). Information regarding demographics, laboratory values, DEXA T-scores, and medical interventions was extracted during the study period (defined as the date of DEXA showing osteopenia and January 1, 2009 and January 1, 2009).

Results/Conclusions: Data collection and analysis are ongoing. Final results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Identify patients with osteopenia in whom consideration of initiation of prescription therapy is recommended based on the National Osteoporosis Foundation (NOF) guidelines.
Discuss how current National Osteoporosis Foundation (NOF) and World Health Organization (WHO) guidelines are unclear regarding the management of osteopenia.

Self Assessment Questions:
Which WHO adapted 10-year hip fracture probability score correctly represents a patient with osteopenia in whom consideration of initiation of prescription therapy is recommended?
A ≥ 3%
B 3-10%
C >10-20%
D >50%

Which of the following statements regarding current guidelines for management of osteopenia is true?
A The NOF guidelines state that treatment should be considered in ≥ 3% or
B Both NOF and WHO guidelines clearly recommend therapy for an ≥ 3% or
C The WHO guidelines recommend a risk based approach without c ≥ 3% or
D Both A and C.

Q1 Answer: A Q2 Answer: D
FACTORS AFFECTING PHARMACEUTICAL TRENDS IN HOSPICE PHARMACY CLAIMS DATA
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Objective: To analyze aggregate hospice pharmaceutical claims data to determine current trends in pharmaceutical cost over patients length of stay (LOS), general trends in pharmaceutical cost and the influence of diagnosis category, care setting, and hospice profit status and access type on cost.

Methods: Pharmaceutical claims data from Hospiscript Services, LLC., a hospice pharmacy benefits manager, will be obtained for the years 2007-2009. For the primary analysis, 2009 data will be utilized to determine the change in average cost per patient per day (PPPD) over patients LOS by calculating the average cost PPPD for patients first week, final week, and time period between the first and final weeks on hospice. This analysis will be performed on aggregate data and on each of the hospice diagnosis categories defined by the Medicare Hospice Benefit. Secondary analyses will be conducted on aggregate data to determine average cost PPPD for each year 2007-2009, most expensive drugs by cost, most prescribed drugs by prescription count, and percentage of patients within each diagnosis category. Additional analyses will be conducted to determine differences between diagnosis categories for average cost PPPD for each year 2007-2009, most expensive drug classes, and average LOS. Other analyses will compare average cost PPPD by each year and identify the most expensive drug classes for home versus facility versus inpatient care. Analyses also will compare differences in average cost PPPD for for-profit versus not-for-profit hospices and for open-access versus non-open-access hospices.

Results: Results will be reported for each of the planned analyses.

Conclusions: Results are expected to determine trends in hospice drug costs over patients LOS and identify other factors affecting drug costs which will provide evidence to inform proposed changes to the current hospice reimbursement structure and future hospice cost-containment decisions.

Learning Objectives:
- Explain the Medicare Hospice Benefit system for hospice reimbursements and how this system affects medication use in hospice patients.
- Recognize how the changes proposed by the Medicare Payment Advisory Commission (MedPAC) may affect hospice reimbursement.

Self Assessment Questions:
What is the current method of reimbursement for hospices and how much are hospices reimbursed daily per patient to pay for all aspects of the patients care related to their terminal dia
- A Fee for service reimbursement, ranging from $145-$500/day for routine care
- B Per diem reimbursement, approximately $300/day for routine hom
- C Per diem reimbursement, approximately $145/day for routine hom
- D Graded reimbursement dependent on length of stay, ranging from

What hospice cost did the Medicare Payment Advisory Committee (MedPAC) take into account when proposing that the current hospice reimbursement scheme be changed to a U-shaped reimbursement curve?
- A Hospice drug costs
- B Hospice visit costs
- C Hospice durable medical equipment costs
- D Hospice administrative costs

Q1 Answer: C Q2 Answer: B

EVALUATION OF PROVIDERS PRESCRIBING APPROACH TO SAFE MEDICATION USE IN THE HOMELESS PATIENT POPULATION
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Purpose: Current literature has identified barriers to safe medication use unique to the homeless patient population. Published adapted clinical guidelines provide recommendations to improve identification of these barriers and suggest methods to increase medication safety. Information regarding actual practice behaviors concerning this population is lacking. The primary objective is: to evaluate provider perception and awareness of barriers in prescribing safe medication for the homeless patient population, concentrating specifically on providers a) priority and role in identifying barriers and b) recognition of barriers to safe medication use.

Methods: During this cross sectional study, an electronic survey will be distributed via email to primary care providers with active Ohio licenses and prescribing authority. A geographically stratified, random sample of providers will be surveyed using email addresses obtained from the State Medical Board of Ohio. Mailed invitation postcards will announce the survey and participation will be incentivized. Survey non-responders will receive once weekly email reminders until the survey is completed or the survey period ends. In the event of low response, an additional stratified, random sample will be selected for study inclusion and survey distribution. The pilot-tested survey consists of questions to identify providers current role and importance placed on identifying barriers to safe medication use in the homeless population. Four case scenario questions in which providers classify a list of medications as safe or unsafe will evaluate recognition of homeless patient barriers to safe medication use. Additional questions will collect demographic information.

Preliminary Results: Survey distribution and data collection will occur from January to March 2011. Preliminary results will be presented at the Great Lakes Residency Conference.

Conclusions: Study results will help define primary care providers perceptions of and current practice in homeless patient medication use and identify opportunities for pharmacist involvement in maximizing medication use safety in the homeless patient population.

Learning Objectives:
- Identify safe medication use barriers experienced among the homeless patient population.
- Recognize that homeless patient medication use barriers may compromise medication safety.

Self Assessment Questions:
Of the homeless patient barriers listed below, which has specifically been identified in current literature as a barrier to medication use safety:
- A financial hardships
- B limited transportation
- C erratic meal source / unpredictable food attainment
- D lack of adequate shelter

Identify the drug therapy that is potentially unsafe for a type II diabetic homeless patient who resides in a shelter where only evening meals are offered and the reliability of these meals has been impaired.
- A metformin
- B glipizide
- C pioglitazone
- D sitagliptin

Q1 Answer: C Q2 Answer: B

ACPE Universal Activity Number 121-999-11-421 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5
IMPACT OF HEALTH-SYSTEM PHARMACISTS AS SEASONAL INFLUENZA VACCINE ADVOCATES AND IMMUNIZERS FOR EMPLOYEES
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Purpose: Published literature has reported the benefits of pharmacists as immunizers for patients in both community and health-system settings. The role of pharmacists as immunizers for employees in a health-system setting has yet to be assessed. In October 2010, the Department of Pharmacy at The Ohio State University Medical Center (OSUMC) implemented a pharmacy-based seasonal influenza immunization program for employees. The goals of the pilot program were to promote pharmacists as vaccine advocates and immunizers, to improve knowledge about the seasonal influenza vaccine, and to facilitate compliance with the seasonal influenza vaccine policy. The three aims of this study are to 1) identify the components involved in the implementation of a pharmacy-based immunization program; 2) evaluate the impact of pharmacists as vaccine advocates and immunizers on employee knowledge of the seasonal influenza vaccine; and 3) measure compliance rates with seasonal influenza vaccination.

Methods: The Department of Pharmacy in conjunction with EHS provided seasonal influenza immunization services to OSUMC employees within targeted departments. Implementation of the program involved various components, including training and orientation of pharmacist immunizers, coordination of services with other departments and integration of services into current workflow. A survey was distributed in January 2011 to two groups, including one group with employees in the departments that received pharmacy-based immunization services and another group with employees who received traditional immunization services. The survey included questions that determined employee satisfaction with seasonal influenza immunization services, employee attitudes and beliefs toward seasonal influenza vaccination, employee perceptions of pharmacists as immunizers, and employee knowledge of seasonal influenza vaccination. Additionally, vaccination and compliance rates for the 2009 - 2010 and the 2010 - 2011 influenza seasons were retrospectively collected and analyzed.

Results: Data collection and evaluation are currently being conducted and results will be presented at the conference.

Learning Objectives:
Identify key components of implementing a pharmacy-based immunization program.
Discuss strategies to educate staff on seasonal influenza vaccination.

Self Assessment Questions:
Which of the following groups does the CDC recommend to receive the seasonal influenza vaccine annually?
A: Everyone 6 months and older.
B: Children 6 months through 8 years and adults 50 years and older.
C: Adults 65 years and older.
D: Only those individuals with chronic medical conditions that increase

Approximately what percent of health care workers were vaccinated against the seasonal influenza virus last year?
A: < 30%
B: 35 – 40%
C: 55 – 80%
D: > 80%

Q1 Answer: A  Q2 Answer: B

LABETALOL VERSUS NICARDIPINE FOR EARLY INTENSIVE BLOOD PRESSURE CONTROL AFTER ACUTE INTRACEREBRAL HEMORRHAGE
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PURPOSE: The optimal agent for acute blood pressure control after spontaneous primary intracerebral hemorrhage (ICH) remains unknown. The objectives of this study are to compare the ability of two IV antihypertensives, labetalol and nicardipine, to achieve and maintain control of elevated blood pressure and examine their effects on patient outcome in ICH.

METHODS: We performed a retrospective cohort study including adult patients with primary ICH who received intermittent labetalol (L) or nicardipine (N) continuous infusion for elevated blood pressure. Patient were excluded for hospital stay < 24 hours, receiving recombinant factor VIIa, insufficient data, pregnancy or prisoner status. Blood pressure readings were obtained for the first 24 hours of hospital stay to determine blood pressure control evaluated as mean SBP per patient, percentage of SBP less than patient-specific goal, treatment failure, and incidence of adverse events related to study medications. Patient outcomes measured were length of stay, Glasgow Outcome Score, modified Rankin Score, and mortality at day 28 or hospital discharge.

RESULTS: Sixty patients with similar baseline demographics (p=0.05) were evaluated. 19.4% L v. 20.8% N were on warfarin at admission (p=0.89). Mean SBP was not different between groups (157 mmHg L v. 152 mmHg N, p=0.12) and % SBP less than goal was not different between L and N (64.3% v. 67.3%, p=0.58). The incidence of adverse events and all measured patient outcomes including mortality did not differ between L and N (13.3% v. 12.5%, p=0.95). There were significantly more treatment failures with labetalol (55.6% L v. 8.3% N, p=0.001).

CONCLUSIONS: Nicardipine may represent a better initial choice for early intensive blood pressure control than labetalol based on decrease treatment failure, but patient outcome is not different based on choice of antihypertensive.

Learning Objectives:
List the antihypertensive agents of choice for control of elevated blood pressure highlighted in the 2007 ICH guidelines.
Explain the impact of the INTERACT trial on blood pressure targets recommended in the current ICH guidelines.

Self Assessment Questions:
The 2007 ICH guidelines recommend all of the following antihypertensive agents for control of elevated blood pressure EXCEPT:
A: labetalol
B: nicardipine
C: nitroprusside
D: metoprolol

The INTERACT trial randomized patients with primary ICH to the guideline-based systolic blood pressure (SBP) target of 180 mmHg compared to which of the following aggressive SBP goals:
A: 130 mmHg
B: 140 mmHg
C: 150 mmHg
D: 160 mmHg

Q1 Answer: D  Q2 Answer: B

ACPE Universal Activity Number: 121-999-11-296-L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
USE OF LOW MOLECULAR WEIGHT HEPARIN (LMWH) IN PREGNANCY: A PHARMACODYNAMIC MODELING STUDY

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Purpose: Deep vein thrombosis (DVT) and pulmonary embolism (PE) are important causes of maternal morbidity and mortality. The overall incidence of DVT and PE during pregnancy has been estimated at approximately 1 per 1000 pregnancies. Low molecular weight heparins (LMWH) are the basis of treatment. The 2008 edition of the American College of Chest Physicians (ACCP) guidelines on Antithrombotic and Thrombolytic Therapy provides recommendations for the use of LMWH during pregnancy. Dosing guidelines are fairly well-defined, however there is no clear recommendation for monitoring included in the guidelines.

Previous studies have shown that the pharmacokinetics of enoxaparin sodium (and other LMWH) are significantly different during pregnancy than in the same women when not pregnant. It is thought that this difference is likely because of increased renal clearance of LMWH during pregnancy. Based upon this, pharmacodynamic data will compliment the pharmacokinetic data that already exists for LMWH. Therefore, the purpose of this study is to perform a retrospective review of records of patients that received LMWH during pregnancy to determine the pharmacodynamics of LMWH in pregnancy.

Methods: The study group is comprised of women that were pregnant, received LMWH therapy, and delivered between January 1, 1998 - November 1, 2010. Cases were evaluated through review of the electronic medical record. The primary outcome is to determine the pharmacodynamics of LMWH in pregnancy. This will be achieved by using WinNonLin, a pharmacodynamic modeling program, to analyze the dosing requirements of LMWH throughout pregnancy and corresponding anti-Xa levels. Secondary outcome measures include frequency of monitoring of anti-Xa levels, thromboembolic events, and bleeding complications with LMWH use in pregnancy.

Results/Conclusion: Data collection is in progress. Final results with conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:
Describe the use of LMWH in pregnancy.
Discuss the pharmacodynamics of LMWH in pregnancy.

Self Assessment Questions:
The therapeutic effects of LMWH use in pregnancy are best monitored by:
A: Activated partial thromboplastin time
B: Anti-factor Xa levels
C: Prothrombin time
D: Platelet count

Pharmacodynamics is generally thought to be the effect of:
A: The drug on the body
B: The body on the drug
C: An interaction between two drugs
D: An interaction between a food and a drug
Q1 Answer: B  Q2 Answer: A

EXPANDING OUTPATIENT PHARMACY SERVICES IN ONCOLOGY THROUGHOUT THE AURORA HEALTH CARE SYSTEM

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Statement of purpose:
As the practice of oncology expands throughout the Aurora Health Care system, there is an opportunity to further develop pharmacist participation in oncology related patient care. Also, with the oncology pharmacist population increasing through the hiring and training of new oncology specialists, it is important that we utilize those resources effectively. The purpose of this project is to assess current practice at system oncology locations and to evaluate opportunities for oncology pharmacist involvement at these sites.

Statement of methods used:
Criteria for determining which sites to target within the Aurora Health Care system were developed. Based on these criteria, target sites were chosen. Each selected location underwent a site initiation visit to introduce the concept of outpatient oncology pharmacy services and to assess clinic receptivity. Plans were made to pilot an oncology pharmacist in each of the selected sites.

Pilots are currently being conducted for each target site. Following pilot completion collected data will be compiled and presented to an appropriate audience. The feasibility of continuing or expanding pharmacist services based on pilot data will be assessed.

Statement of preliminary results to support conclusions:
Results are currently being collected and will be presented at the Great Lakes Residency Conference.

Conclusions reached:
Conclusions based pilot results will be presented at the Great Lakes Residency Conference.

Learning Objectives:
Describe two types of services that a pharmacist can provide in the outpatient oncology setting.
List two supportive care issues that are currently being managed by pharmacists under collaborative practice agreements in the United States.

Self Assessment Questions:
Which of the following are services that can be performed by a pharmacist in an outpatient oncology setting?
A: Chemotherapy education
B: Supportive care management
C: Drug information provision
D: All of the above

Which of the following is not a criterion for selecting a clinic that may benefit from having a pharmacist?
A: Low patient volume
B: Need for improved patient wait time
C: Physician familiarity and previous pharmacy interactions
D: Significant medication expense

Q1 Answer: D  Q2 Answer: A

ACPE Universal Activity Number 121-999-11-431 -L04-P
Activity Type: Knowledge-based  Contact Hours: 0.5
EVALUATION OF RENAL FUNCTION ESTIMATIONS IN THE TRAUMA/SURGICAL INTENSIVE CARE UNIT

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Background: The MDRD and Cockcroft-Gault equations are commonly used to estimate renal function in the critical care setting, but were derived from patient populations that did not include the critically ill. Critically ill patients commonly exhibit fluctuations in serum creatinine as a result of acute illness, which may adversely affect the accuracy of these estimates. Inaccurate assessment of renal function has several potential consequences, including improper dosing of renally eliminated drugs. The objective of this study is to determine which method of estimating renal function most closely correlates with 24-hour urinary creatinine clearance in trauma/surgical intensive care patients.

Methods: This is a prospective, observational study conducted at Akron General Medical Center from December 2010 to March 2011. Trauma/surgical intensive care patients ≥ 18 years of age with available 24-hour urine collections were included in the study. Patients were excluded if they received renal replacement therapy, were administered drugs affecting creatinine secretion, were oliguric or anuric, or had urinary outlet obstruction. Data collected from electronic medical records and by investigator measurement included admitting diagnosis, comorbidities, demographic data, height, weight, urine volume and creatinine concentration, serum creatinine, albumin, BUN, prealbumin, and transferrin. Multiple urine collections from a single patient were included in the data analysis if they were performed at least 6 days apart. Estimated creatinine clearance from the Cockcroft-Gault formula and estimated GFR from the 4 and 6-variable MDRD equations were compared to determine which estimate most closely correlates with measured 24-hour urinary creatinine clearance. Secondary outcomes compared the MDRD equation with and without adjustment for BSA, and the Cockcroft-Gault equation using actual body weight versus ideal or adjusted body weight. A subgroup analysis compared patients with stable versus unstable serum creatinine.

Results/Conclusion: To be presented at the Great Lakes Pharmacy Resident Conference

Learning Objectives:
Describe limitations of commonly used methods for estimating renal function.
Recognize patient characteristics that may affect the accuracy of renal function estimates.

Self Assessment Questions:
Which of the following variables are used in the MDRD equations.
A Height
B Weight
C Gender
D Serum potassium
Which of the following may result in underestimation of renal function?
A Increased muscle mass
B Cachexia
C Hemodialysis
D Acute renal failure

Q1 Answer: C Q2 Answer: A

ACPE Universal Activity Number 121-999-11-251-L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
IMPLEMENTATION OF A VENOUS THROMBOEMBOLISM PROPHYLAXIS STRATEGY TO REDUCE READMISSION RATES IN AN INPATIENT COMMUNITY HOSPITAL
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Background/Purpose:
Venous Thromboembolism (VTE) prophylaxis, which includes mechanical and pharmacological measures, remains chronically underutilized nationwide. An estimated 300,000 to 600,000 Americans suffer from symptoms of a deep vein thrombosis (DVT) or pulmonary embolism (PE) each year and approximately 100,000 deaths each year are directly or indirectly related to these conditions. Despite the implementation of advanced technology and availability of updated guidelines, an optimal screening process is still not in use in our institution. There is lack of hospital-wide knowledge and no consistently implemented prophylaxis plan to prevent readmission due to secondary VTE. The objective of this project is to determine the impact of less than optimal DVT prophylaxis and its direct effect on the rate of readmission and to develop a strategy to ensure appropriate DVT prophylaxis.

Methods:
Our institution processes monthly reports which include the incidence of timely prophylaxis, correct treatment overlap, and readmission rates DVT or PE. The information gathered will allow us to determine if VTE risk assessment was completed; to evaluate prophylaxis measures based on guidelines; to prevent incorrect timing of prophylaxis initiation; to quantify complications of the primary diagnosis that led to a thromboembolic event; and to distinguish defined contraindications to prophylactic therapy. The use of the following steps to make appropriate changes will be based on the information gathered. The first step is to educate pharmacists, nurses, and physicians on VTE risk factors; appropriate VTE prophylaxis; correct bridge therapy, and proper treatment of DVT or PE. The second step is to standardize hospital-wide processes for screening all admissions. The third step is to focus on providing appropriate DVT prophylaxis during hospital stays. Continuation of appropriate anticoagulation upon discharge and reduction of readmission for VTE will be the final focus.

Results/Conclusions:
To be presented at the Great Lakes Pharmacy Resident Conference

Learning Objectives:
List the reasons VTE prophylaxis in hospitalized patients is important. Describe the steps this institution is taking to ensure appropriate VTE prophylaxis is ordered within an acceptable amount of time after hospital admission.

Self Assessment Questions:
Approximately how many deaths occur each year related directly or indirectly to VTE?
A: 100
B: 100,000
C: 650,000
D: 2,000

Which of the following is an appropriate choice for VTE prophylaxis therapy?
A: Heparin
B: Enoxaparin
C: Sequential Compression Devices
D: All of the above

Q1 Answer: B Q2 Answer: D

ACPE Universal Activity Number 121-999-11-308 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

DECENTRALIZED PHARMACIST FACILITATION OF THE MEDICATION DISCHARGE PROCESS IN A BEHAVIORAL HEALTH UNIT
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Background/Purpose:
Several studies have shown that pharmacist involvement increases the effectiveness of medication reconciliation at admission and discharge. Additionally, literature reported that pharmacist involvement in interdisciplinary rounds and other services improved patient outcomes. Currently, this institution does not have decentralized pharmacists in the inpatient behavioral health department. This study seeks to determine if a decentralized pharmacist can improve discharge medication order accuracy and completeness at the time of discharge. The primary objective is to determine what discrepancies are occurring and how frequently they arise on discharge medication orders. Collaboration with the medical team will enable the pharmacist to gain patient information and ensure that the patient receives the appropriate treatment after discharge from the hospital.

Methods:
This project was submitted to the Clinical Research Steering Committee and the Institutional Review Board and was granted exempted status. The study began with pharmacist participation in interdisciplinary rounds to establish the daily procedures for the pharmacist. Patients discharged from the unit were monitored and the accuracy of the admission medication orders were compared to the discharge medication orders. Each medication discrepancy was recorded and included proper medication, strength, dose, route, directions, duration, medical necessity, quantity, and if refills were needed. Data collection occurred for 30 days or a total of 50 subjects. Study subjects under 18 or greater than 80 years old were excluded. Transfer patients from other nursing units (except the emergency department) or subjects with admissions in the past 30 days were excluded as well. Staff satisfaction with decentralized pharmacist involvement was also measured through surveys prior to and at the conclusion of the study.

Results/Conclusions:
Results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Identify the effects of a decentralized pharmacist on the discharge process in a behavioral health unit. Discuss which medication discrepancies are reduced by decentralized pharmacy involvement on a nursing unit.

Self Assessment Questions:
The two most common medication discrepancies found by a decentralized pharmacist in the behavioral health unit were:
A: wrong drug and wrong route
B: no quantity and no refills on new medications
C: wrong drug strength and wrong quantity
D: wrong duration and wrong route

The most significant barrier to establishing the pharmacist role on a new behavioral health unit was:
A: establishing connections with the correct administrators to initiate the project
B: gaining staff acceptance for pharmacy involvement
C: establishing communication methods to ensure efficient medication management
D: no significant barriers were encountered

Q1 Answer: B Q2 Answer: A

ACPE Universal Activity Number 121-999-11-405 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5
ASSESSMENT OF APPROPRIATE MANAGEMENT OF POSTOPERATIVE NAUSEA AND VOMITING (PONV) IN ADULTS THROUGH THE UTILIZATION OF A RISK-STRATIFIED ALGORITHM

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Purpose:
Postoperative nausea and vomiting (PONV) when untreated can affect up to 80% of high-risk surgical patients and 20-30% of general surgery patients. Ineffective or inappropriate management of PONV can lead to an increased length of stay and has the potential to complicate other medical problems and thus lead to increased hospital costs. Multiple studies have researched appropriate measures to manage PONV and several guidelines have been developed to guide incorporation into clinical practice settings. A common theme throughout the guidelines involves identification of patient risk factors for development of PONV and selection of antiemetic therapy based on risk stratification. The primary objective of this study was to determine adherence to the current guidelines and treatment recommendations from the Society for Ambulatory Anesthesia for the management of PONV in a subset of female, high-risk surgical patients at Gundersen Lutheran Medical Center.

Methods:
This is a retrospective chart review study that utilized Gundersen Lutheran Medical Centers electronic medical record to identify high-risk surgical patients who were admitted as an inpatient postoperatively. The surgical procedures were limited to open and robotic hysterectomy surgeries to allow analysis of the most high-risk patients with multiple risk factors for PONV. ICD-9 codes were utilized to identify records that matched the criteria. The data collected included the following: gender, age, type of surgery, type of anesthesia, prophylactic antiemetic usage and timing, smoking status, history of PONV or motion sickness, postoperative opioid usage, incidence of PONV, and duration of hospitalization. The incidence of PONV was determined through the analysis of nursing document flowsheets. Patients who were less than 18 years of age and patients undergoing same-day surgeries were excluded from this study.

Results:
Data collection was completed in January 2011 with ongoing data analysis. Final results with conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Identify patient risk factors commonly associated with postoperative nausea and vomiting (PONV). Recognize that the dosage and timing of antiemetic therapy is related to its effectiveness at preventing PONV.

Self Assessment Questions:
Which of the following is associated with an increased risk of postoperative nausea and vomiting (PONV)?
A Male gender
B Nonsmoking status
C Age > 65
D Current outpatient opioid therapy

5-HT3 antagonists, such as ondansetron, are most effective at preventing PONV when given at what time in relation to surgery?
A Evening before surgery
B Anesthesia induction
C Intraoperatively
D End of surgery

Q1 Answer: B Q2 Answer: D

COMPARISON OF HYBRID VERSUS DECENTRALIZED MEDICATION DISTRIBUTION SYSTEMS

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Purpose:
The purpose of this investigation is to determine the most efficient and cost effective method of distributing unit dose medications to inpatient units at the University of Wisconsin Hospital and Clinics (UWHC). The objectives of this study are to: Analyze the medication cart fill process to identify opportunities for improvement, measure the labor, technology, and medication inventory necessary to support the hybrid medication distribution systems in place at UWHC, measure the labor, technology, and medication inventory necessary to support a decentralized medication distribution system at a comparator institution, develop a computer model to simulate a decentralized medication distribution system at UWHC, provide recommendations for future improvements to UWHCs medication distribution systems.

Methods:
Observations of the cart fill process have been performed to develop time standards. An analysis of the timing of discontinued medication orders was performed. The dosing times for medication filled on the cart fill were assessed. These data were synthesized into a value stream map to identify opportunities for improvements to the cart fill process.

Pharmacist and pharmacy technician fulltime equivalent staffing models will be analyzed to determine the labor required to support the hybrid medication distribution systems. Observations will be conducted to measure nursing time required to obtain and prepare medications. The cost of the technology required to support the hybrid medication distribution system will be assessed utilizing departmental budget data. Annual inventory assessment will be utilized to calculate inventory turns and medication inventory cost. Analysis of the above measures will be performed at the comparator institution.

A computer simulation of decentralized dispensing at UWHC will be developed utilizing data gathered at UWHC and the comparator institution to assess the impact of transitioning from hybrid to decentralized medication distribution.

Results/Conclusions:
Results and conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:
Describe the concept of value stream mapping as a process improvement tool.
Describe the advantages and disadvantages of utilizing direct observation to develop time standards.

Self Assessment Questions:
As a value stream mapping tool, process efficiency is represented mathematically by:
A Non-value-added time/total process lead time
B Value-added time/non-value-added time
C Value-added time/ total process lead time
D Non-value-added time/(value-added time + non-value-added time)

Direct observation is subject to confounding via the:
A Heisenberg effect
B Hoffman effect
C Butterfly effect
D Hawthorne effect

Q1 Answer: C Q2 Answer: D

ACPE Universal Activity Number 121-999-11-362 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

ACPE Universal Activity Number 121-999-11-411 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5
Purpose: Adequate control of chemotherapy-induced nausea and vomiting (CINV) in children is often difficult and largely dependent on the chemotherapeutic regimen as well as dose, schedule, and emetogenicity of the agents used therein. The purpose of this study is to assess the medication regimens used for prevention and control of CINV in children at Toledo Children's Hospital and determine methods to improve current practice for future patients.

Methods: This study is a retrospective chart review that has been submitted and approved through the hospitals institutional review board. All English speaking patients, ages 3 through 21 years of age, actively receiving treatment (chemotherapy, radiation therapy) for an oncologic diagnosis within Toledo Children's Hospital Pediatric Hematology Oncology Program between January 1st, 2010 and June 30th, 2010, and having an antiemetic medication prescribed will be included in the study. Those patients who have undergone surgery to minimize tumor burden and received an antiemetic medication during this time frame will be excluded. Also, those patients receiving chemotherapy who have had surgery for intravenous line or port placement and received an antiemetic medication within 48 hours post-surgery will be excluded. Data was collected retrospectively from patients charts and computer records, and included demographic information, diagnosis history, treatment history as it pertains to receipt of chemotherapy and or radiation therapy, and treatments used for management of anticipatory and acute CINV in the inpatient and outpatient settings. Objective data, such as severity of nausea, frequency of emesis, and CINV rescue medications used were recorded when available.

Results: A total of 41 patients were initially identified for inclusion in the study. Ten patients were excluded; six were less than 3 years of age, one did not receive chemotherapy, and three did not have an antiemetic prescribed during the study period. Final results will be presented at Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Identify common types and notable complications of chemotherapy-induced nausea and vomiting in pediatric patients.
List common treatments and dosages of antiemetic medications supported by the literature for use in pediatric patients.

Self Assessment Questions:
Which of the following statements is correct?
A: Approximately 30% of children receiving chemotherapy are affected
B: Anticipatory nausea and vomiting is more concern in the adult population
C: Males are generally considered to suffer from CINV more often than females
D: Nausea and vomiting may lead to significant dehydration, electrolyte imbalances

Which of the following antiemetic regimens is most appropriate based on the regimen efficacy and cost?
A: Ondansetron 0.45 mg/kg IV prior to chemotherapy and promethazine
B: Ondansetron 0.45 mg/kg IV prior to chemotherapy and ondansetron
C: Ondansetron 0.15 mg/kg IV prior to chemotherapy and diphenhydramine
D: Ondansetron 0.15 mg/kg IV prior to chemotherapy and metoclopramide

Q1 Answer: D  Q2 Answer: B

GENETIC DRIFT OF INDIVIDUAL ISOLATES OF VANCOMYCIN RESISTANT ENTEROCOCCUS FAECIUM OVER TIME
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Purpose: Vancomycin-resistant Enterococci (VRE) are of increasing concern due to their transmissibility and ability to cause nosocomial infection. Clinical active surveillance is often employed to prospectively identify VRE colonized patients via screening in order to identify patients and control transmissibility. To determine transmissions, VRE isolates can be typed by pulse-field gel electrophoresis (PFGE) and analyzed using accepted criteria for organism relatedness. Such classification is important for antimicrobial stewardship as this surveillance allows stewardship programs and Infection Control to track new VRE colonizations and categorize them as transmissions or de novo resistance. The objective of this study was to evaluate the temporal genetic drift of VRE isolates classified by PFGE. The primary objective was to determine the number of PFGE bands differing over time to define the duration of time that progeny strains could be considered nearly isogenic to the parent isolate.

Methods: A microbiology/epidemiology database of PFGE classified VRE faecium isolates collected at Northwestern Memorial Hospital (NMH) was searched. Available frozen isolates between September 2003 and October 2010 were considered for inclusion. Clinically cultured, VRE isolates that were considered to be possibly genetically related per established criteria (i.e. within 6 bands of the parent strain) were reviewed. For individual inclusion, a minimum of 4 isolates per individual temporarily separated by at least 3 months was required. Data analysis was completed using Intercooled Stata version 11.1.

Results/Conclusions
Results and conclusions will be presented at the conference.

Learning Objectives:
- Explain the use of infection control techniques to screen for VRE transmissions.
- Review the use of genetic typing to identify VRE transmissions.

Self Assessment Questions:
Which of the following statements is correct?
A: An outbreak occurs when VRE is transferred from patient to patient
B: Genetic typing of VRE with PFGE can help to minimize transmissions
C: Infection control protocols are less important than genetic typing of VRE
D: Patients who are immunocompromised are not at risk for VRE transmission

Which of the following statements is the most accurate regarding genetic typing with PFGE?
A: Criteria is lacking to standardize organism relatedness
B: Genetic typing can help direct the allocation of resources for infection control
C: It is only useful for lab work and cannot be clinically correlated
D: PFGE determines the type of organism and is useful for identification of VRE

Q1 Answer: B  Q2 Answer: B

ACPE Universal Activity Number 121-999-11-178 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5

PEDIATRIC CARE PLAN
NAUSEA AND VOMITING (CINV) IN PEDIATRIC PATIENTS: DEVELOPMENT OF A PEDIATRIC CARE PLAN
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Which of the following antiemetic regimens is most appropriate based on the regimen efficacy and cost?
A: Ondansetron 0.45 mg/kg IV prior to chemotherapy and promethazine
B: Ondansetron 0.45 mg/kg IV prior to chemotherapy and ondansetron
C: Ondansetron 0.15 mg/kg IV prior to chemotherapy and diphenhydramine
D: Ondansetron 0.15 mg/kg IV prior to chemotherapy and metoclopramide

Q1 Answer: D  Q2 Answer: B

ACPE Universal Activity Number 121-999-11-164 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
CHARACTERIZATION OF THE CLINICAL OUTCOMES OF CTX-M-PRODUCING ESCHERICHIA COLI URINARY TRACT INFECTIONS (UTI)
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Purpose: Escherichia coli is a common cause of urinary tract infections (UTI) and may harbor extended-spectrum beta lactamases (ESBL). ESBL-producing bacteria are more challenging to treat as they confer resistance to oxymonox cephalosporins. Over the past decade the significance of a new ESBL type, CTX-M has been recognized. Unlike previously recognized ESBL types, CTX-M is commonly community-acquired. Investigators at Northwestern Memorial Hospital (NMH) recently characterized the molecular epidemiology and corresponding resistance phenotypes of CTX-M at this institution. Overall, CTX-M was the primary ESBL and was isolated in 58% of all ESBL-producing E. coli studied. The impact of CTX-M on clinical outcomes in UTIs has not been elucidated to date. In addition to increased resistance, CTX-M may be associated with E. coli strains exhibiting differences in virulence. The purpose of this study is to retrospectively characterize the clinical and microbiologic outcomes of CTX-M producing E. coli UTIs compared to patients with non-CTX-M-type ESBL producing E. coli and non-ESBL producing E. coli

Methods: A retrospective, observational, cohort study has been designed to characterize differences in clinical outcomes between three groups of patients with E. coli UTIs: those with isolates not producing ESBL (control group), those with isolates producing CTX-M type ESBL and those with isolates producing non-CTX-M type ESBL (case groups).

Results/Conclusions: Data collection and analysis are in progress. Results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Self Assessment Questions:
Identify the correct statement:
A: Extended-spectrum beta lactamases are frequently encoded on plasmids
B: Extended-spectrum beta lactamases do not usually occur in conjunction with AmpC cephalosporinases
C: Pathogens producing extended-spectrum beta lactamases can be selected by extended-spectrum cephalosporins
D: Carbapenem resistance is usually due to intrinsic resistance

Identify the correct statement:
A: CTX-M is different from other extended-spectrum beta lactamases
B: CTX-M is never acquired in the community and is always a result of acquired resistance
C: Among ESBLs, the recognition of CTX-M in clinical isolates is decreasing
D: CTX-M is so named because it has greater affinity for CefTriaXone

Q1 Answer: A Q2 Answer: A

CORRELATION BETWEEN METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS (MRSA) NASAL SWAB CULTURES AND RISK OF MRSA BACTEREMIA AND PNEUMONIA
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Purpose
Current literature regarding the potential risk of subsequent infection (bacteremia or pneumonia) in patients with MRSA nasal colonization is conflicting. The primary objective of the study is to determine if there is a positive or negative correlation between MRSA nasal swab culture results and risk of MRSA bacteremia and/or pneumonia.

Methods
Using the MRSA nasal swab active culture surveillance report we identified patients who were hospitalized, from 8/1/09 through 8/1/10, and received MRSA nasal swabs. These patients were then examined by a retrospective chart review. The following data were collected from the medical records: results of MRSA nasal swab (positive or negative), age, gender, admitting and discharge diagnosis, culture date, prior antibiotic use (including agent and duration), and blood culture and chest x-ray results (if applicable). MRSA bacteremia and pneumonia were defined using discharge diagnosis and microbiology culture data. Performed prior to initiation, we received Institutional Review Board approval from both Blanchard Valley Health System and the University of Findlay.

Inclusion criteria
All patients who received a nasal swab during their hospitalization were included in this analysis.

Exclusion criteria
Patients were excluded if there was a surgical site infections and pediatric patients (< 18 years of age).

Self Assessment Questions:
Which of the following is an appropriate screening tool to detect MRSA colonization patient
A: chest x-ray
B: blood culture
C: nasal swab
D: urine culture

Which of the following is an appropriate screening tool to detect MRSA colonization patient
A: increased risk of invasive MRSA infection
B: decreased risk of invasive MRSA infection
C: correlation does not exist
D: increased use of glycopeptides

Which of the following is an appropriate screening tool to detect MRSA colonization patient
A: chest x-ray
B: blood culture
C: nasal swab
D: urine culture

Q1 Answer: A Q2 Answer: C

Activity Type: Knowledge-based Contact Hours: 0.5
DEVELOPMENT OF OUTPATIENT PHARMACY METRICS WITHIN AN ACADEMIC MEDICAL CENTER

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Purpose:
Froedtert Health is a regional integrated academic medical center (AMC) that includes three hospitals, seven primary care clinics, and four outpatient pharmacies. Froedtert Health provides outpatient pharmacy services to a variety of patients including discharge patients, specialty service patients, and staff members. Each of these patients have unique prescriptions that require varied amount of clinical and administrative pharmacy resources. Historically, the outpatient pharmacy budget and workforce were based upon the total number of prescriptions dispensed from each pharmacy. The concerns within our pharmacies are that the number of prescriptions dispensed are poor predictors of the amount of resources required for dispensing each prescription in our AMC pharmacies.

In the process of evaluating various trends, the pharmacies are commonly benchmarked against other retail pharmacies, which range from community retail pharmacies to large chain retail pharmacies. While these evaluations are useful within specific areas, the ability to evaluate the impact of 340B drug purchasing, patient assistance programs, specialty pharmacy procedures, and home delivery opportunities does not provide sufficient evidence within the AMC outpatient pharmacy setting. The goal of this project is to develop outpatient pharmacy metrics that evaluate the financial operations of outpatient pharmacies within an AMC and benchmark these metrics against other AMCs.

Methods:
An in-depth evaluation of Froedtert outpatient pharmacies financials will be benchmarked against national pharmacy averages and AMC averages to develop a true understanding of the potential differences between community pharmacies and AMC outpatient pharmacies. The AMC averages will be determined by requesting data from outpatient pharmacy managers at various academic medical centers. This project is exempt from IRB as patient specific data will not be collected.

Results/Conclusions:
The research is in the collection phase. Final results and conclusion will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Identify reasons for benchmarking difficulties within AMC outpatient pharmacies.
Indicate the defining differences between discharge, specialty, and refill prescriptions within Froedtert Hospital.
Self Assessment Questions:
Which factor makes prescription volume a poor predictor of the resources needed within an AMC outpatient pharmacy?
A Location of pharmacy
B Variable acuity prescriptions
C Increased patient volume
D Staffing schedules

Which prescription has the highest acuity within the AMC outpatient pharmacy?
A Hypertension
B Transplant
C Depression
D Anticoagulation

Q1 Answer: B Q2 Answer: B

A PILOT ANALYSIS OF REQUIRED SERVICE-LEARNING: CHARACTERISTICS INFLUENCING STUDENTS ATTITUDES

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Objective: Although not a required element in the Accreditation Council for Pharmacy Education (ACPE) accreditation standards for colleges of pharmacy, service-learning is offered or required in many doctor of pharmacy (PharmD) programs. Service-learning is a form of experiential education that reinforces concepts taught in the classroom while offering a service that is mutually beneficial for both student and the community. Ideally, service learning also fosters professional responsibility and a sense of caring for others. Our purpose is to identify specific, modifiable characteristics of required service-learning that correlate with students positive experiences with and attitudes about service-learning.

Methods: A survey instrument was designed, based upon previously-validated instruments in other disciplines, to identify and assess factors known to influence attitudes about service learning, will be developed. The study will be conducted during February of 2011 and active pharmacy interns within the state of Ohio will be invited to participate. An electronic survey will be sent to all active pharmacy interns who have provided the Ohio State Board of Pharmacy an email address.

Results: Measured characteristics will include the number of service hours required, placement in the PharmD curriculum, whether or not the student was involved in planning the activity, and whether or not the student discussed activities with a mentor. Students satisfaction as well as intention to participate in future service will also be assessed. Data analysis will be conducted in partnership with The Ohio State University School of Public Health.

Conclusions: Results are expected to identify a correlation, positive or negative, between one or more of the modifiable, curricular characteristics, and students attitudes towards service learning. By identifying characteristics that influence students attitudes about service learning, pharmacy curricula can be prospectively adapted to improve the outcomes required and elective service experiences.

Learning Objectives:
Identify components of service-learning that differentiate it from volunteerism or experiential rotations. Select curricular characteristics that may influence students attitudes towards future service participation.

Self Assessment Questions:
Which of the following characteristics is/are true?
A Applies material learned in the classroom
B Benefits both the participant and recipient
C Reflection activities are essential
D All of the above

Which of the following are true?
A ACPE requires service-learning of all colleges of pharmacy seeking accreditation
B ACPE provides recommendations on what colleges of pharmacy should include
C ACPE allows service-learning experiences to replace intermediate pharmacy requirements
D ACPE requires specific curricular characteristics for service-learning

Q1 Answer: D Q2 Answer: B

ACPE Universal Activity Number 121-999-11-432-L04-P
Activity Type: Knowledge-based Contact Hours: 0.5
WITHDRAWAL OF INHALED CORTICOSTEROIDS BY A PHARMACIST LED PATIENT ALIGNED CARE TEAM CHRONIC OBSTRUCTIVE PULMONARY DISEASE CLINIC
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Statement of purpose
Purpose: The prescribing of inhaled corticosteroids for the treatment of mild-moderate chronic obstructive pulmonary disease (COPD) has been found to be >50% in most cases even though the Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines do not recommend this therapy. The withdrawal of inhaled corticosteroids, by a pharmacist, within a Patient Aligned Care Team environment has not been described. The purpose of this study is to withdraw inhaled corticosteroids from patients who have documented mild or moderate COPD based upon spirometry readings. The completion of this study will help to establish the role that a clinical pharmacist can have within a COPD primary care clinic within the Patient Aligned Care Team model. Evidence-based medical guidelines will be followed to decrease the medication burden that a patient experiences.

Statement of methods used
Methods: Patients that meet criteria will be invited to attend a COPD clinic appointment with the pharmacist. All patients recruited will be from physicians participating in the Patient Aligned Care Team groups at our facility. At the appointment, inhaled corticosteroids will be withdrawn from the patient’s regimen. If he/she does not have an appropriate medication ordered (albuterol, ipratropium, formoterol) that will also be ordered at the first appointment along with a questionnaire to determine the patient’s shortness of breath. This test will be re-administered at follow up, two months after the initial visit, to compare the first score. The test given will be a validated survey called the Shortness of Breath Questionnaire (SOBQ) and is currently in use at our facility by the cardiopulmonary rehab team.

Learning Objectives:
Review the indications for use of inhaled corticosteroids in the treatment of COPD.
Explain the role of a Veterans Affairs Clinical Pharmacy Specialist within a chronic obstructive disease primary care clinic.

Self Assessment Questions:
A clinical pharmacist within the Veterans Affairs medical system in the ambulatory setting can perform which of the following activities:
A: Order medications for a patient
B: Make suggestions to a patient’s primary care physician
C: Order follow-up lab work for a patient
D: All of the above

All of the following medications are indicated in the treatment of mild-moderate COPD except
A: albuterol
B: mometasone
C: formoterol
D: ipratropium
Q1 Answer: D  Q2 Answer: B

ACPE Universal Activity Number 121-999-11-100-L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5

ASSESSMENT OF SUPPORTIVE HEALTH ENVIRONMENTS: WORKSITE VS. WORKSITE AND HOME
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Purpose: Studies have shown the benefits of health promotion programs at the worksite including increased employee energy and productivity. These studies have only looked at the benefit of providing a worksite supportive environment. Our hypothesis is that combining a worksite and home supportive environments through engaging employees’ family members, workers will improve their clinical measure: and energy, and decrease presenteeism greater than those employees who have a worksite supportive environment alone.

Methods: Prior to commencement the Institutional Review Board approved this study. This prospective, non-blinded study includes two groups: worksite supportive environment and a combination of worksite and home supportive environments. After obtaining informed consent, participants 18 and older will undergo two 45 minute health screenings three months apart that will include a fasting lipid panel, fasting blood sugar, blood pressure, weight, body mass index, and waist circumference. A HgA1c may also be performed if necessary. Participants will be asked to complete three questionnaires to assess energy level (Short Form-8 Item), presenteeism in the worksite (Health and Work Performance), and diet and physical activity (Simple Lifestyle Index). Participants aged 6-17 will be assessed for age, height, weight and BMI that is calculated from standardized CDC growth charts.

Pacientes will complete a questionnaire on children energy level (Short Form 10 Item). At the initial health screening, pharmacists will assist participants in establishing health goals. Throughout the course of the study, educational sessions, healthy recipes, and health tips will be provided to participants to assist in achieving the individuals health goal(s). At the completion of the study, results from the pre-and post-health screenings, questionnaires and health goal(s) attainment will be assessed and compared in the worksite only supportive environment and the combination worksite and home supportive environments.

Results: Results and conclusion to be presented at Great Lakes Residency Conference

Learning Objectives:
Discuss the differences between worksite supportive environments and combination of worksite and home supportive environments. Identify differences between the HPQ, SLIQ, SF-8, and SF-10 questionnaires.

Self Assessment Questions:
Which of the following questionnaires is completed by parents to assess their child’s energy level:
A: Simple Lifestyle Index Questionnaire
B: Health and Work Performance Questionnaire
C: Short Form - 10 Questionnaire
D: Short Form - 8 Questionnaire

The official term used to describe an environment that encourages the overconsumption of energy-dense foods is:
A: Obesogenic
B: Obesity-Inclined
C: Sugar-Driven
D: Foodophilia

Q1 Answer: C  Q2 Answer: A

ACPE Universal Activity Number 121-999-11-408-L04-P
Activity Type: Knowledge-based  Contact Hours: 0.5
EVALUATING THE IMPACT OF EMPIRIC TREATMENT FOR COMMUNITY ACQUIRED METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS (CA-MRSA) IN SKIN AND SOFT TISSUE INFECTIONS.
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Purpose: To examine the empiric treatment of skin and soft tissue infections (SSTIs) in patients presenting to the Huntington Veterans Affairs Medical Center (HVAMC). The goal is to review prescribing patterns and evaluate the most accurate empiric choice of antibiotics when treating SSTIs. Community-acquired methicillin-resistant Staphylococcus aureus (CA-MRSA) is an infection acquired in the community among patients who are lacking risk factors for exposure to health care systems. Literature differs as to whether it is necessary to adequately cover CA-MRSA when empirically treating SSTIs and often defaults to community incidence of MRSA. Current literature is conflicted regarding treating SSTIs with incision and drainage (I&D) alone or to use it in combination with appropriate antimicrobial therapy.

Methods: A retrospective chart review of patients presenting to the HVAMC with suspected SSTI will be performed. Patient charts will be reviewed for treatment and outcomes associated with SSTIs, reviewing success for various treatment options including: I&D alone, MRSA antibiotic alone, non-MRSA antibiotic alone, combination of I&D and MRSA antibiotic, and combination of I&D and non-MRSA antibiotic. The primary endpoint of the study will be to determine infection recurrence rates within 90 days associated with the various therapy options listed; infection recurrence rates will be defined by the presence of worsening signs or symptoms of infection or the requirement for further interventions which include: additional antibiotics, further debridement, or surgery. Secondary endpoints will include: duration of antimicrobial therapy, complications or side effects of specific therapies, and culture and susceptibility results. Providers will be educated based on the findings in an attempt to guide future empiric treatment of SSTIs.

Results: Data collection is currently in progress and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Describe Infectious Diseases Society of America current guideline recommendations for management of skin and soft tissue infections in the era of CA-MRSA.
Discuss available evidence regarding the empiric coverage of CA-MRSA when treating skin and soft tissue infections.

Self Assessment Questions:
Which antibiotic would be an appropriate choice when empirically covering for CA-MRSA in outpatients?
A: Trimethoprim-sulfamethoxazole
B: Cephalexin
C: Clindamycin
D: A or C

Based on the Infectious Diseases Society of America guidelines discussed, which of the following statements are correct?
A: In patients with a simple abscess, it is recommended to perform in
B: In patients with purulent cellulitis, empirical coverage of CA-MRSA
C: In patients with nonpurulent cellulitis, empirical coverage of CA-MRSA
D: A fourteen day course of antibiotics is recommended for treatment

Q1 Answer: D Q2 Answer: B

INTERMITTENT DOSING OF ROSUVASTATIN IN PATIENTS WITH PREVIOUS STATIN INTOLERANCE
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Purpose: Coronary artery disease (CAD) is the leading cause of death in the U.S. Low-density lipoprotein cholesterol (LDL-C) has a large impact on the development of atherosclerosis and CAD. Statins are the most effective agents at lowering LDL-C. Statin side effects include myalgia, increased liver enzymes, headache, and gastrointestinal disturbances. Unfortunately, many patients who experience myalgia or increased liver enzymes are deemed statin intolerant and discontinue the medication. Myalgia and increased liver enzymes are considered dose related side effects. Thus, a reduction in these side effects should be seen when lower doses are prescribed. Intermittent dosing of statins three times a week, is an approach aimed to improve statin tolerance and lower LDL-C in patients who would have otherwise discontinued statin therapy. The LSCVAMC lipid clinic pharmacists prescribe intermittent dosing of rosuvastatin in patients with previous statin intolerance. This study will evaluate the efficacy and tolerability of intermittent dosing of rosuvastatin patients and provide guidance for future prescribing practice.

Objective: To determine the absolute LDL-C reduction of intermittently dosed rosuvastatin in patients with prior statin intolerance.

Methodology: A retrospective chart review will evaluate the absolute LDL-C lowering of intermittent dosed rosuvastatin in patients with a previous documented statin intolerance between January 1, 2008 to June 30, 2010. This study will include patients with a previous statin intolerance who are on three times a week dosing of rosuvastatin (2.5 mg or 5 mg), do not have an active prescription for vitamin D and no documented adverse drug reaction of rhabdomyolysis. The primary endpoint of the study will compare the absolute LDL-C lowering after 6 weeks (+/- 14 days) of intermittent dosing of rosuvastatin to baseline. Secondary endpoints will determine the number of patients at LDL-C goal; percentage of patients experiencing myalgia symptoms, adverse effects adherence, and tolerability.

Results/conclusions: Pending.

Learning Objectives:
Identify dose related side effects of statins.
Identify patients who would benefit from intermittent dosing of rosuvastatin.

Self Assessment Questions:
Which of the following is a dose related side effect of statin therapy?
A: Myalgias
B: Gastrointestinal disturbances
C: Headache
D: Sedation

Intermittent dosing of high potent statin therapy in patients with a previous statin intolerance due to myalgias or elevated liver enzymes is an approach aimed to improve:
A: Drug tolerability
B: Medication adherence
C: LDL-C lowering
D: All of the above

Q1 Answer: A Q2 Answer: D

ACPE Universal Activity Number 121-999-11-217 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
THE DEVELOPMENT OF AN ELECTRONIC PATIENT ACUITY SCORING TOOL
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Purpose: The purpose of this project is to evaluate and optimize the clinical monitoring of patients by pharmacists throughout Aurora Health Care. Through the implementation of an electronic medical record and the ability to prioritize patients based on their acuity, a new process for monitoring patients was created. The clinical monitoring tool is ideally designed to standardize the pharmacists priorities for interventions and monitoring, in turn, making the workflow more efficient. This standardization and streamlining of processes also allows for continuity of care and improved patient safety.

Methods: Prior to commencement, this study was reviewed and approved by the Institutional Review Board. The initial design of the scoring system was predetermined prior to the opening of a new hospital. The first step in this evaluation consisted of a survey of pharmacists to assess what components of the new software would be helpful in monitoring patients. All results were compiled and discussed with a committee of pharmacists across the Aurora Health Care System. This committee then summarized the identified areas of improvement. This committee revised the initial scoring criteria to incorporate current hospital drug monitoring policies as well as patient monitoring improvements. These changes will be implemented and a reassessment to determine effectiveness, efficiency and value of the tool verses the initial version will be conducted. The final design of the clinical monitoring tool will then be ready for implementation to the other Aurora Health Care hospitals when they transition to the new computer system over the next three years.

Results: Results and conclusions will be discussed at Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Identify ways to better streamline patient monitoring.
Describe the value of standardizing the process of patient monitoring.

Self Assessment Questions:
The clinical monitoring tool was designed to identify what type of patients?
A: Patients that have been admitted for less than 24 hours.
B: Patients with more than five disease states.
C: Patients with possible pharmaceutical interventions.
D: Patients that are full code and over the age of 65.

What is the goal of using the clinical monitoring tool?
A: Sit and watch patient's points change throughout the day.
B: Standardize patient monitoring, while making workflow more efficacious.
C: Force pharmacists to practice a certain way.
D: Allow pharmacists to duplicate each other's work.

Q1 Answer: C Q2 Answer: B

A RETROSPECTIVE EVALUATION OF THE INCIDENCE OF ACUTE RESPIRATORY DISTRESS SYNDROME FOLLOWING SINGLE DOSE ETOMIDATE DURING RAPID SEQUENCE INTUBATION IN TRAUMA PATIENTS.
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Purpose: Etomidate has become the most widely used agent for rapid sequence intubation (RSI), but it is associated with short term adrenal insufficiency. The use of etomidate was associated with a trend towards an increased incidence of acute respiratory distress syndrome (ARDS) in a previous study of patients with traumatic brain injuries. Our study will compare the incidence of ARDS between trauma patients undergoing RSI at OSUMC who did or did not receive etomidate.

Methods: A retrospective chart review will be conducted in trauma patients who were mechanically ventilated from January 1, 2003 to September 1, 2010. Exclusion criteria include those less than 18 years of age, age greater than 89, pregnancy, prisoners, burn and near-drowning patients. The data to be collected will include demographics (age, weight, height, and gender), injury severity scores, medications for intubation, evaluation of chest radiographs, laboratory values and data on oxygen delivery. Acute lung injury (ALI) will be defined as bilateral infiltrates of acute onset on chest radiograph of non cardiac origin with a partial pressure of oxygen/fraction of inspired oxygen (PF ratio) of ≤ 200 mmHg. ARDS will meet all the criteria of ALI but must have a PF ratio of ≤ 200 mmHg. The primary outcome will be the incidence of ARDS between patients receiving etomidate and those not receiving etomidate for RSI. Secondary outcomes will include the incidence of ALI, length of mechanical ventilation, length of stay, and mortality. Statistical analysis will be performed by either fishers exact or linear regression.

Results: Results and conclusions will be presented at the meeting.

Learning Objectives:
Define what is the Acute Respiratory Distress Syndrome (ARDS).
Describe possible sequelae of using etomidate for RSI.

Self Assessment Questions:
Which of the following would qualify as having ARDS?
A: Bilateral infiltrates of acute onset and a PF ratio of 250
B: Unilateral infiltrates of acute onset and a PF ratio of 150
C: Bilateral infiltrates of acute onset and a PF ratio of 150
D: Unilateral infiltrates of acute onset and a PF ratio of 250

Which of the following is a known adverse effect of etomidate?
A: Immunosuppression
B: Adrenal Suppression
C: Thrombocytopenia
D: Pancytopenia

Q1 Answer: C Q2 Answer: B
FACTOR IX COMPLEX (PROFILNINE) FOR RAPID REVERSAL OF WARFARIN COAGULOPATHY

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Purpose: Major bleeding can occur in up to 6.5% of patients on warfarin per year. Fatal bleeding, primarily involving intracerebral hemorrhage (ICH), occurs in approximately 1% annually. Major or life threatening bleeding requires rapid reversal of anticoagulation to reduce blood loss, control hemorrhage, and decrease mortality. Fresh frozen plasma (FFP) is a blood product containing the clotting factors inhibited by warfarin including factors II, VII, IX, and X. This product provides clotting factors in a non-concentrated form and therefore large volumes are required to replace the deficient clotting factors. Factor IX complex also contains vitamin K dependent clotting factors. Unlike FFP, these clotting factors are available in a concentrated form which can be administered in a small volume, without the need for thawing or checking the blood type. The objective of this study is to compare time to reversal of INR in warfarin treated patients with ICH receiving factor IX complex and vitamin K to a historical group of patients who received FFP and vitamin K.

Results and Conclusions: Data collection is ongoing. Results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Describe benefits of factor IX complex when compared to fresh frozen plasma.
Recall appropriate dosage regimens of factor IX complex for rapid warfarin reversal.

Self Assessment Questions:
Which of the following would be considered an advantage of factor IX complex compared to fresh frozen plasma?
A: Large volume for reversal of anticoagulation
B: Need for thawing
C: Cost
D: Rapid onset of action

Which of the following would be an appropriate factor IX complex dose for rapid warfarin reversal in a patient admitted with life threatening bleeding?
A: 2.5 units/kg
B: 2.5 mcg/kg
C: 25 units/kg
D: 250 mcg/kg

Q1 Answer: D  Q2 Answer: C

Efficacy of Clinical Decision Support in Monitoring for Metabolic Syndrome in Patients on Atypical Antipsychotics and Effect on Rate of Clinical Intervention

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Objective
Atypical antipsychotics are notorious for causing metabolic irregularities, including weight gain, hyperglycemia, hypertension and hyperlipidemia. The objective of this project is to assess the efficacy of clinical decision support, specifically a Best Practice Alert (BPA), in ensuring monitoring for metabolic syndrome in patients on atypical antipsychotics. The primary outcome of this study is the rate of compliance with monitoring requirements for metabolic syndrome, which were reviewed with the Behavioral Department and established in accordance with current guidelines prior to data collection. These monitoring requirements are yearly fasting lipid panel and hemoglobin A1C or fasting blood glucose; weight and blood pressure were monitored at each visit following establishment of the monitoring schedule. The secondary outcomes include change in therapeutic agent (atypical), referral to primary care or endocrinology for metabolic changes, lifestyle modification counseling by the prescribing psychiatrist, and initiation of metformin; these were measured by chart review.

Methods
This is a retrospective cohort study with historical control, using "patient as own control". All patients on the atypical antipsychotic clozapine, ziprasidone, paliperidone, risperidone, quetiapine, olanzapine, or aripiprazole prescribed by Behavioral Health practitioners including are included. Data collection and analysis occurred from December 21st, 2010 through March 31st, 2011. The rates of outcomes are measured by paired t-test, with rates of compliance with the monitoring schedule and rates of the clinical outcomes listed above compared in patients before and after the BPA was installed. The clinical value of this BPA is evaluated by analyzing differences in rates of compliance with that monitoring protocol, as well as rates of metabolic syndrome-related interventions (secondary outcomes), before and after the BPA is put in place.

Results
Data collection is ongoing. Results and conclusions will be presented at Great Lakes Pharmacy Residency Conference.

Learning Objectives:
List specific components of appropriate monitoring for metabolic syndrome in patients on atypical antipsychotics.
Discuss potential applications, benefits and drawbacks of clinical decision support.

Self Assessment Questions:
Which of the following is correct regarding monitoring for metabolic syndrome in patients on atypical antipsychotics?
A: After baseline measurement, the first follow-up fasting lipid panel 12-26 months later
B: Blood pressure, lipid and glyemic goals apply equally to patients on and off BPA
C: Monitoring for metabolic risks associated with antipsychotics may be performed in the clinic
D: Monitoring for weight gain is optional after three years of treatment

Clinical decision support such as Best Practice alerts can lead to which of the following?
A: Decreased alert fatigue
B: Clear reductions in health care costs
C: Increased adherence to treatment guidelines
D: Both A and C

Q1 Answer: B  Q2 Answer: C

ACPE Universal Activity Number 121-999-11-188 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5

ACPE Universal Activity Number 121-999-11-310 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
Background: Candidemia is a common and serious cause of nosocomial bloodstream infections. Delayed therapy for treatment of Candidemia leads to significant increases in mortality making early identification crucial for successful management. The objective of this study is to identify specific factors which increase the likelihood of developing Candidemia and to validate hospital criteria for the use of Echinocandins prior to species identification.

Methods: The Institutional Review Committee at Saint Joseph Hospital has approved this retrospective, case control trial aimed at identifying risk factors for Candidemia in intensive care unit patients. As a secondary endpoint, time to antifungal medication initiation will be analyzed. This study included patients ≥ 18 years of age who are admitted to a medical or surgical intensive care unit for 5 days or longer. Patients will be excluded from the study if they had a positive blood culture on admission. Comparators will be matched based on age, sex and intensive care unit stay of 5 days or longer. The study timeframe is January 2007 through December 2009. Patients with Candidemia will be selected from a microbiology lab database. Patients will be screened for demographic information and co morbid conditions. Lab data including serum creatinine, alkaline phosphatase, Candida colonization and neutropenia will be collected and analyzed. Other common risk factors such as total length of intensive care unit and hospital stay, overall outcome, surgery, total parenteral nutrition administration, blood product transfusions, central venous catheter, hemodialysis, immunosuppressive medication, prophylaxis within 30 days, transfer from another healthcare facility, mechanical ventilation and chronic antifungal prophylaxis will also be reviewed. Risk factors will be identified as those variables that are significantly associated with candidemia through stepwise regression analysis.

Results and Conclusions: Data collection currently in progress. Preliminary results and conclusions to be presented.

Learning Objectives:
Identify factors associated with the bedside Candida scoring system. Describe empiric antifungal regimens for treatment of suspected Candidemia.

Self Assessment Questions:
CA is a 40 YO female who presents to the ED with severe sepsis, AKF, respiratory failure requiring ventilation. Pt has noted fungal infection under her breast and in her urine. Pt has a PMH of diabetes
A: 1
B: 2
C: 3
D: 4
Which of the following antifungal treatments would be most appropriate for CA?
A: Micafungin 100mg IV daily
B: Fluconazole 200mg IV daily
C: Fluconazole 100mg IV daily
D: Flucytosine 25mg/kg PO Every 6 Hours
Q1 Answer: D Q2 Answer: A

Validation of Hospital Criteria for Use of Echinocandins
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The purpose of this study is to characterize the awareness and understanding of REMS among pharmacy students enrolled in the Doctor of Pharmacy program at the University of Illinois at Chicago (UIC). In addition, this study aims to gather information regarding students experience with REMS and their reactions to existing REMS. From these data, researchers will be able to evaluate the extent to which pharmacy education and pharmacy practice have aligned with new safety regulations and suggest modifications to the pharmacy curriculum to better educate students on drug safety. To achieve these aims, researchers are conducting an anonymous, web-based survey of students enrolled in the Doctor of Pharmacy program at UIC. Students will be asked to provide demographic data and information regarding their previous pharmacy experience, including experiences in retail and hospital settings, as well as experiential education. The survey will also address students knowledge of and experience with medication safety tools, as well as their reactions to REMS as a means to ensure the safe use of medications. A descriptive analysis of the gathered data will be performed. Data collection is currently ongoing.

Learning Objectives:
Discuss the importance of increased safety education in the Doctor of Pharmacy curriculum. Recognize the potential role of the pharmacist in the implementation of REMS.

Self Assessment Questions:
Why is it important for students to gain an understanding of REMS prior to practicing pharmacy?
A: Most pharmacy graduates are incapable of providing safe pharmacy care
B: To prevent graduating pharmacists from being sued for not implementing REMS
C: Most pharmacy graduates are ill-equipped to take advantage of the opportunities REMS offers
D: To increase graduating pharmacists’ chances of being hired upon graduation

How will REMS affect the practice of pharmacy?
A: It will prevent pharmacists from dispensing high risk drugs
B: It will expand the role of the pharmacist in the medication use process
C: It will encourage pharmacists to dispense unsafe drugs
D: It will discourage pharmacists from taking on leadership roles

Q1 Answer: C Q2 Answer: B

OVERALL AWARENESS AND REACTION TO RISK EVALUATION AND MITIGATION STRATEGIES (REMS) AMONG PHARMACY STUDENTS AT THE UNIVERSITY OF ILLINOIS AT CHICAGO
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Pharmacy curriculum.
Recognize the potential role of the pharmacist in the implementation of REMS.

Learning Objectives:
Discuss the importance of increased safety education in the Doctor of Pharmacy curriculum. Recognize the potential role of the pharmacist in the implementation of REMS.

Self Assessment Questions:
Why is it important for students to gain an understanding of REMS prior to practicing pharmacy?
A: Most pharmacy graduates are incapable of providing safe pharmacy care
B: To prevent graduating pharmacists from being sued for not implementing REMS
C: Most pharmacy graduates are ill-equipped to take advantage of the opportunities REMS offers
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How will REMS affect the practice of pharmacy?
A: It will prevent pharmacists from dispensing high risk drugs
B: It will expand the role of the pharmacist in the medication use process
C: It will encourage pharmacists to dispense unsafe drugs
D: It will discourage pharmacists from taking on leadership roles

Q1 Answer: C Q2 Answer: B

ACPE Universal Activity Number 121-999-11-453 -L05-P
Activity Type: Knowledge-based Contact Hours: 0.5
**TREAT TO GOAL: LONG TERM IMPACT OF CLINICAL PHARMACIST REFERRAL SERVICE ON DIABETES MANAGEMENT**

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**TREAT TO GOAL: LONG TERM IMPACT OF CLINICAL PHARMACIST REFERRAL SERVICE ON DIABETES MANAGEMENT**

Thomas M Henry, PharmD, RPh*, Stephen E Thomas, PharmD, RPh, Steven R Smith, MS, RPh

**PURPOSE:** The implementation of pharmacists to the health care team to manage diabetes and other chronic disease states is well known. However, data evaluating the long term impact of pharmacist collaborative management in diabetes (defined as >12 months) and other concurrent disease states is more obscure. Moreover, the importance of presenting data of pharmacist-physician collaborative efforts from specific institutions is essential to proving the continued need for pharmacy services at their respective sites. The purpose of this study is to evaluate the efficacy of clinical pharmacy services at the Center of Health Services (CHS) adult medicine clinic that have been in effect since 2005.

**METHODS:** A retrospective chart audit will be conducted from all patients referred to the pharmacy clinic at CHS from August 1, 2010 to March 1, 2011. Data will be collected using patient charts and computer records. Data will include patient demographics, number of disease states, chronic medications, and total number of pharmacist visits. Diabetic standards of care will be addressed by collecting data on smoking status, hemoglobin A1c, albumin/creatinine ratio, blood pressure, lipid panels, adherence to annual comprehensive foot check and eye exam, and immunization of influenza and pneumococcal vaccine. Medications will also be closely evaluated, including data on utilization of ACE-I, statin, aspirin and mealtime insulin, as well as interventions by pharmacists that include dose adjustments, addition and subtraction of medications, or changing of medications within the same therapeutic drug class.

**PRELIMINARY RESULTS:** Complete data analysis will be performed at the end of data collection.

**CONCLUSIONS:** Conclusions will be reached upon completion of data analysis.

**Learning Objectives:**
Relate the national control rates of diabetes mellitus to the control rates of diabetes mellitus from patients seen in the pharmacy clinic at the Center of Health Services (CHS).
Name the diabetes standards of medical care according to the American Diabetes Association 2010 guidelines.

**Self Assessment Questions:**
What are some examples of standards of diabetes care that can be applied to most patients with type 1 and type 2 diabetes?
A: LDL < 70 mg/dl, A1c < 7%, semiannual foot exam, BP < 120/80
B: LDL < 100 mg/dl, A1c < 7%, annual dilated eye exam, pneumococci
C: A1c < 7%, 150 min/week of moderate intensity aerobic exercise, a diet, 120/80

How often should an HgbA1c lab be ordered in most patients who have uncontrolled diabetes?
A: Every 3 months
B: Every 6 months
C: Every month
D: Every year

Q1 Answer: B Q2 Answer: A

**EVALUATION OF PHARMACOLOGIC TREATMENT OF NEUROPATHIC PAIN BY PRIMARY CARE IN A TERTIARY INSTITUTION**

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**Purpose:**
The purpose of this retrospective study is to identify the prescribing practices of primary care practitioners (PCPs) treating neuropathic pain.

**Methods:**
This is a retrospective chart review of patients with an active diagnosis of neuropathic pain between July 2005 and September 2010. The primary endpoint is frequency of medications prescribed to treat neuropathic pain in the study population; secondary endpoints include maximum dose trialed for each pain medication prescribed and an evaluation of the efficacy of the maximum dose. Inclusion criteria include active diagnosis of neuropathic pain between July 2005 to September 2010 (identified by International Disease Classification, Ninth Revision code), receipt of at least one prescription for treatment of neuropathic pain at our facility, and greater than 18 years of age. If a patient has been evaluated by the Pain Clinic or Neurology teams, data will be excluded for 5 years following that visit date. Medications will be excluded if they are utilized to treat other chronic pain that is not of primarily neuropathic origin. Efficacy will be determined by a change of 30% or greater in patient reported pain scores between initial PCP visit where medication in question was prescribed and follow-up PCP visit where medication was not increased further. Data to be collected includes age, gender, neuropathic pain diagnosis, all pain medications prescribed between January 2000 and September 2010 at our facility, maximum dose attained of each pain medication, pain score at initial PCP visit, pain score at PCP follow-up visit, referral to Pain or Neurology clinics and date of initial specialty clinic visit.

**Results/Conclusions:**
Results and conclusions are pending and will be presented at the Great Lakes Pharmacy Residency Conference.

**Learning Objectives:**
Select an appropriate medication to treat neuropathic pain based on a patient case.
Restate the algorithm for treatment of neuropathic pain utilized at the William S. Middleton Memorial Veterans Hospital.

**Self Assessment Questions:**
An 86 year old male presents to clinic recently diagnosed with diabetic neuropathy. Patient has a history of benign prostatic hypertrophy. Which of the following would be the best recommendation to

A: Amitriptyline
B: Gabapentin
C: Naproxen
D: Topiramate

Based on the neuropathic pain treatment algorithm from the William S. Middleton Memorial Veterans Hospital, which are the following are correct:

A: Gabapentin and/or a tricyclic antidepressant are first line therapy for non-focal neuropathy.
B: Lidocaine patch is first line option for postherpetic or focal neuropathy.
C: Pregabalin or duloxetine are first line therapy for chronic neuropathy.
D: Tramadol is preferred over opioid agonists as add-on or second line therapy.

Q1 Answer: B Q2 Answer: A

**ACPE Universal Activity Number** 121-999-11-225 -L01-P

**Activity Type:** Knowledge-based  **Contact Hours:** 0.5
OVER-THE-COUNTER PRODUCT (OTC) AND DIETARY SUPPLEMENT USE IN COMMUNITY PHARMACY PATIENTS WITH CHRONIC MEDICAL CONDITIONS: A SURVEY INVESTIGATING PATIENT KNOWLEDGE, USE, AND PERCEPTIONS ABOUT OTC PRODU

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Purpose
The purpose of this research is to evaluate community pharmacy patients’ perceptions of OTC products and dietary supplements. This research will also examine if patient use products appropriately and report use of products to health care providers. The results will help evaluate the need of pharmacist education and intervention in respect to OTC products and dietary supplements, in patients with chronic medical conditions. A comparison of perceptions based on patient background will help to assess and identify a need for education and intervention to specific patient populations.

Methods
A pilot survey will be distributed to 10 community pharmacies nationally. A total of four stores in the Midwest region (three Chicago area locations and one Minnesota location), three stores in the West Coast region (California), and three stores in the East Coast region (Philadelphia and Virginia) will be utilized. The pharmacies were chosen based on prevalent patient populations within the individual location, with ethnicities such as Caucasian, Asian, African American, and Hispanic represented. A convenience sample will be utilized. Patients will be approached to participate in the survey by the pharmacy staff during workflow functions. The questionnaire will include a cover letter explaining the objectives of the study, the benefits to participants, and the confidential nature of the survey. For data analysis, patients with chronic disease will be compared to patients without chronic disease. Results will be entered into Microsoft Excel and SPSS will be utilized for statistical analysis. Frequencies for all background variables will be reported. Comparisons of knowledge, use, and perceptions by background characteristics, type of illness, and region will be conducted Chi Square will be used for categorical variables. T-test or ANOVA will be used for continuous variables.

Results/Conclusion
Results and conclusions are pending and will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Define products classified by the FDA as over-the-counter (OTC) and dietary supplements.
Discuss potential drug-drug and drug-disease interactions that may occur in patients using OTC products and dietary supplements without consulting their health care provider.

Self Assessment Questions:
According to the Food and Drug Administration (FDA), which of the following are considered dietary supplements?
A. Vitamin B12
B. Arginine
C. Selenium
D. All of the above
Which OTC medication(s) listed below would be a concern in a patient taking warfarin?
A. Acetaminophen
B. Ibuprofen
C. A&B
D. Vitamin D
Q1 Answer: D  Q2 Answer: C

A RETROSPECTIVE COMPARISON OF DAPTOMYCIN THRICE-WEEKLY VERSUS Q48H DOSING IN HEMODIALYSIS PATIENTS WITH VANCOMYCIN-RESISTANT ENTEROCOCCUS (VRE) OR METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS (MRSA) BACTEREMIA

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PURPOSE: Multi-drug resistant bacteria are a growing concern in healthcare. Two increasingly problematic pathogens are vancomycin-resistant enterococci (VRE) and methicillin-resistant Staphylococcus aureus (MRSA). Daptomycin is being used with increasing frequency in the treatment of VRE and MRSA bacteremias in hemodialysis (HD) patients. The manufacturer recommends dosing daptomycin every 48 hours for the treatment of bacteremia in patients on HD, but a small body of pharmacokinetic data exists to suggest that HD patients may maintain daptomycin concentrations sufficient for the treatment of VRE and MRSA 68 hours after a dose. This suggests that HD patients may be able to receive thrice-weekly doses of daptomycin rather than every 48 hours, allowing for coordination of dosing with common outpatient HD schedules.

The objective of this study was to retrospectively assess clinical and microbiological outcomes in hemodialysis patients with VRE or MRSA bacteremia treated with thrice-weekly daptomycin compared to patients treated with traditional “q48h” dosing.

METHODS: All patients with positive blood cultures who received at least one dose of daptomycin between January 1st 2009 and December 31st 2009 at Methodist and Indiana University Hospitals were identified. Subjects were enrolled in the study if they were age ≥ 18 years, had end stage renal disease on a stable thrice-weekly hemodialysis regimen, had VRE or MRSA bacteremia confirmed by positive blood cultures, and received at least three doses of inpatient daptomycin therapy on one of the study schedules.

Data were obtained through a retrospective review of electronic medical records. Clinical indicators of infection, including daily temperature and WBC counts, were used to assess clinical cure. Time to first completely negative blood culture was used to assess microbiologic cure.

RESULTS: Results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Identify appropriate candidates for treatment with daptomycin.
Recognize the potential benefits of dosing daptomycin thrice weekly in hemodialysis patients.

Self Assessment Questions:
All of the following may be potential candidates for treatment with daptomycin EXCEPT:
A. VRE bacteremia with daptomycin MIC = 2
B. MRSA bacteremia with vancomycin MIC = 2
C. MRSA bacteremia with concomitant MRSA cellulitis
D. MRSA bacteremia with concomitant MRSA pneumonia

Which of the following would be a benefit of dosing daptomycin thrice weekly in hemodialysis patients?
A. Increased cost
B. Increased convenience
C. Decreased efficacy
D. Decreased duration of treatment

Q1 Answer: D  Q2 Answer: B

ACPE Universal Activity Number 121-999-11-165 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
IMPROVING EFFICIENCY OF WORKFLOW IN AN ONCOLOGY INFUSION PHARMACY

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Purpose:
Indiana University Health Arnett owns two oncology clinics, Cancer Care and Horizon Oncology. The focus of this study will be at Cancer Care, which contains eighteen infusion chairs for patients to receive chemotherapy and non-chemotherapy treatments. The pharmacy processes about thirty-five infusions per day, of which approximately 30% are non-chemotherapy.

The infusion pharmacy has undergone renovation in order to fulfill requirements for licensure and function as a satellite of the hospital pharmacy. The objective of this study is to improve the efficiency of workflow at Cancer Care. Outcomes of this study will be applied to other pharmacy operations, including Horizon Oncology.

Methods:
Data for this project will be collected at Cancer Care. All patients visiting the clinic to receive intravenous infusion therapy will be included. Data will be collected from October through December. Time points will be collected using patient specific pharmacy order sheets used to record times for administration. Changes occurring during data collection will be noted and analyzed.

The primary outcome is workflow efficiency defined by time measurements obtained throughout the pharmacy processes. Secondary outcomes include nursing satisfaction with pharmacy services.

To evaluate nursing satisfaction, a brief questionnaire will be developed. Distribution of this survey will be done using Survey Monkey in October and February to reflect views for both of the data collection groups.

Data will be collected and analyzed using a regression analysis. Factors included in statistical analysis will include the number of medication orders presented in a given period of time as well as the time and date of order entry. Staffing will also be considered for each day data is collected. Days of the week will be analyzed to determine if one day is busier than the other.

Learning Objectives:
Outline the past and current pharmacy processes at Indiana University Health Arnett Cancer Care.
Recognize areas for improvement in workflow in future oncology infusion pharmacies.

Self Assessment Questions:
Which of the following is a change from previous pharmacy processes at Indiana University Health Arnett Cancer Care?
A: Two pharmacists are always scheduled
B: Two technicians are always scheduled
C: Nursing hand delivers the order to the pharmacy
D: Pharmacy always delivers prepared infusions to the nurses

Which of the following is a potential area for improvement in workflow?
A: Implementation of a ‘camera’ verification system for drug preparation
B: Less staffing support during busy infusion periods
C: Increase use of open-ended order sets
D: Technicians checking chemotherapy preparations when pharmacy

Q1 Answer: B  Q2 Answer: A

ACPE Universal Activity Number 121-999-11-439-L04-P
Activity Type: Knowledge-based  Contact Hours: 0.5

EVALUATION OF EXTENDED INFUSION PIPERACILLIN-TAZOBACTAM IN A VA POPULATION

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Background:
Traditional dosing of piperacillin-tazobactam utilizes a 30 minute infusion every 4-6 hours. Several studies have shown that the administration of piperacillin-tazobactam with a 4 hour infusion every 8 hours was equivalent to, and in certain populations more effective than, traditional dosing. This novel dosing strategy became known as extended infusion dosing. There is an opportunity to expand on the data available for the VA population with regard to extended infusion dosing. Furthermore, the use of extended infusion dosing in conditions where cultures are not routinely obtained has not been studied.

Purpose:
The purpose of this study is to evaluate clinical and cost-related outcomes pre- and post-implementation of extended infusion piperacillin tazobactam at Jesse Brown VA Medical Center. This study retrospectively compares traditional dosing against the extended infusion regimen, examining the differences in length of stay, mortality, appropriate initial dosing of piperacillin-tazobactam, adverse drug events, and cost. Further subgroup analysis examines similar outcomes in specific populations.

Methods:
On February 1st, 2010, extended infusion dosing of piperacillin-tazobactam was implemented at Jesse Brown VA Medical Center. This study is a retrospective, electronic chart review of subjects who have received either traditional dosing or extended infusion dosing of piperacillin-tazobactam. Data was captured from February 1st, 2010 to November 30th, 2010 for extended infusion dosing and February 1st 2009 to November 30th, 2009 for traditional dosing. Primary endpoints include length of hospital stay, 14-day mortality, and 30-day mortality. Sub-group analyses were performed based on bacterial culture results, stage of renal disease, indication for treatment, hospital ward location, and Charlson co-morbidity severity score. Further analysis was performed in each group looking at adverse events, appropriate dosing, and overall cost.

Results/Conclusions:
Data collection and analysis are ongoing. Final results with conclusions will be presented at the Great Lakes Residency Pharmacy Conference.

Learning Objectives:
Describe the pharmacokinetic rationale behind extended infusion dosing of piperacillin-tazobactam.
State the potential benefits of implementation of extended infusion piperacillin-tazobactam.

Self Assessment Questions:
Which of the following antimicrobial properties does piperacillin-tazobactam possess which increases its activity the longer the serum concentration is above minimum inhibitory concentration?
A: Concentration-dependent activity
B: Time-dependent activity
C: Post antibiotic effect
D: Pre antibiotic effect

Which of the following is a true statement regarding extended infusion dosing of piperacillin-tazobactam when compared to traditional dosing?
A: More dosage adjustments are necessary based on disease state
B: Greater quantity of drug (in milligrams) used in per day in a patient
C: Plasma concentrations are above the MIC for less time
D: Fewer dosage adjustments are needed based on renal function

Q1 Answer: B  Q2 Answer: D

ACPE Universal Activity Number 121-999-11-084-L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
DISPENSING ASTHMA MEDICATIONS TO PEDIATRIC PATIENTS UPON DISCHARGE: IMPACT ON HOSPITAL READMISSIONS

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Purpose: Asthma is a chronic disease that can be controlled by proper medication use and adherence. However, asthma exacerbations continue to be a common cause of hospital and emergency department (ED) admissions at pediatric institutions. Patients are frequently discharged with multiple prescriptions, and the responsibility of obtaining medications is placed on the family. Encouraging staff to send discharge prescriptions to the pediatric institutions outpatient pharmacy ensures that families leave the hospital campus with proper medications and counseling. The objective of this study is to determine if asthma patients who obtain discharge medications from the pediatric institutions outpatient pharmacy have a lower readmission rate than those who do not.

Methods: This case-control study is approved by the Institutional Review Board. Using a large pediatric institutions electronic medical record system, patients aged two and older admitted to the hospital or ED with a principal ICD-9 diagnosis of asthma or wheezing in October 2008 through June 2010 were identified. These data were compared to the outpatient pharmacy records to identify patients who obtained discharge prescriptions on-campus. A Chi-squared test will be used to determine if there is a significant association between the variable of obtaining discharge medications at the outpatient pharmacy and a lower incidence of readmission within 30 days. The data will be used to assess the importance of providing asthma medications to discharged pediatric patients before they leave the hospital campus.

Results and Conclusions: Analysis of results is ongoing. Results and conclusions will be presented at the Great Lakes Residency Conference

Learning Objectives:
Identify risk factors for severe, uncontrolled asthma in pediatric patients.
Describe opportunities for pharmacist impact in the management of chronic pediatric asthma.

Self Assessment Questions:
1. Which of the following is a known predictor associated with increased risk of asthma exacerbations or death?
   A: Treatment with a long-acting beta agonist
   B: Male gender
   C: Recent diagnosis with asthma
   D: Multiple emergency department visits for asthma in the past year

2. What does the Expert Panel Report-3 recommend for every discharged asthma patient?
   A: Referral to an asthma specialist
   B: Education about medications
   C: Issuing a peak flow meter and giving education on its use
   D: Treatment with antibiotics

Q1 Answer: D    Q2 Answer: B

EVALUATION OF A SPECIALTY PHARMACY PROGRAM IN SOLID ORGAN TRANSPLANTATION

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Purpose: Patient adherence to medication regimens is essential to prevent morbidity, mortality, and organ rejection following transplant. Barriers to adherence include high costs of medications and lack of sufficient prescription insurance coverage. In 2008, the University of Michigan Health System created a specialty pharmacy program to assist patients in obtaining medications and to foster continuity of care following solid organ transplantation. The purpose of this study is to demonstrate the value of this program within the institution. Study objectives include evaluating the economic impact of the program on the health system, assessing patient and provider satisfaction with the program, and evaluating clinical parameters, including medication adherence, readmission rates, and length of hospital stay after transplant.

Methods: The economic impact of the program was assessed using a single-center, comprehensive financial analysis. Net margin was calculated using gross revenue and total operating expenses from the programs first fiscal year. Cross-sectional qualitative surveys were used to evaluate patient and healthcare provider satisfaction with the program. Clinical parameters were assessed using single-center, retrospective, observational cohort studies. The following data were collected from the electronic medical record: medication possession ratios for valganciclovir and mycophenolate, hospital readmissions within 90 days of transplant, and length of hospitalization following transplantation. Patients enrolled in the program who received kidney transplants between July 1, 2009 and June 30, 2010 were included. Patients who were younger than 18 years of age, received multi-organ transplants, or died during transplant surgery hospitalization were excluded. Medication adherence will be compared to a historical control group whereas readmission and length of stay will be compared to data from patients who received kidney transplants between July 1, 2007 and June 30, 2008. This study has been approved by the Institutional Review Board.

Results: In progress

Conclusion: In progress

Learning Objectives:
Explain the importance of medication adherence after solid organ transplantation.
List the services that were developed by the University of Michigan to overcome key barriers to adherence that occur in transplant patients.

Self Assessment Questions:
Adherence to immunosuppressant medications
   A: increases the risk of death.
   B: reduces the risk of graft rejection.
   C: decreases insurance coverage options.
   D: has no effect on overall medical costs.

Which of the following is a service provided by the University of Michigan transplant specialty pharmacy?
   A: Provides only transplant-related medications
   B: Automatic enrollment of all transplant patients
   C: Hospital delivery of home medications prior to discharge
   D: Assistance with financial and insurance-related problems for selected patients

Q1 Answer: B    Q2 Answer: C

ACPE Universal Activity Number 121-999-11-390 -L04-P
Activity Type: Knowledge-based    Contact Hours: 0.5
EFFICACY OF VORICONAZOLE VERSUS FLUCONAZOLE FOR PRIMARY PROPHYLAXIS OF INVASIVE FUNGAL INFECTIONS AFTER MATCHED RELATED DONOR BONE MARROW TRANSPLANTATION AT THE UNIVERSITY OF MICHIGAN HOSPITALS AND HEALTH CENTERS

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Purpose: For several years, voriconazole was the primary agent used for prophylaxis of invasive fungal infections (IFI) in allogeneic transplant recipients at the University of Michigan. This practice was changed in matched related donor (MRD) bone marrow transplant (BMT) patients in light of a multicenter study that demonstrated no significant difference in fungal-free survival rates between patients that received fluconazole versus voriconazole for primary prophylaxis. However, differences in practice and patient population raise concern over the generalizability of these results to our institution. This study will examine the impact of this change, with regard to breakthrough fungal infections and medication intolerance, to determine the most appropriate agent for primary prophylaxis of IFIs at the University of Michigan Health System.

Methods: This retrospective, observational, cohort study was submitted to the Institutional Review Board for approval prior to commencement. A BMT database was used to identify patients that received matched related donor bone marrow transplantations from January 2007 to December 2010. The institutions electronic medication administration record (eMAR) will be used to identify patients that received voriconazole or fluconazole during this time period. The electronic medical record and BMT database will be used to collect baseline characteristics and other pertinent data. Data to be collected include age, sex, underlying disease presence of GVHD, baseline immunosuppression, use of high dose steroids, and time to treatment failure. The electronic medication administration record (eMAR) will be used to identify patients that had changes in antifungal therapy and the Electronic Medical Record Search Engine (EMERSE) will be used to determine if patients failed due to breakthrough fungal infection or medication intolerance. The incidence of treatment failure (i.e. breakthrough fungal infections and intolerance) will be calculated and the type of breakthrough fungal infections will be quantified.

Results: In process

Conclusion: In process

Learning Objectives:
Describe the rationale for primary prophylaxis of fungal infections in bone marrow transplant patients.
List the two species of fungi responsible for the majority of fungal infections in bone marrow transplant patients.

Self Assessment Questions:
What are the risk factors for infection in bone marrow transplant patients?
A: neutropenia, immunosuppressive medications, graft versus host d
B: advanced age, immunosuppressive medications, HLA match
C: leukocytosis, less than 90 days from transplant, HLA mismatch
D: neutropenia, graft versus host disease, tumor lysis syndrome

What are the two species of fungi responsible for the majority of fungal infections in bone marrow transplant patients?
A Candida and Fusarium
B Candida and Aspergillus
C Fusarium and Mucor
D Aspergillus and Cryptococcus

Q1 Answer: A Q2 Answer: B

DO PATIENTS REQUIRE ADMISSIONS TO THE INTENSIVE CARE UNIT FOR DKA?

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Background:
Diabetic ketoacidosis (DKA) is a metabolic disorder involving hyperglycemia, metabolic acidosis, and ketonemia. DKA accounts for thousands of hospital admissions each year that contribute to significant healthcare costs. The treatment of DKA includes administration of IV fluids, insulin therapy, and correcting any electrolyte abnormalities.

Methods:
This is an IRB approved retrospective review of patients who received continuous insulin infusion (CII) for DKA at Harper University Hospital, Detroit Receiving Hospital, and Sinai Grace Hospital. Patients were included if they had an anion gap greater than 10, blood glucose greater than 250 mg/dL, and a serum bicarbonate less than or equal to 18 mmol/L. Exclusion criteria were those patients less than 18 years of age, pregnancy, and who received mechanical ventilation.

Results:
Results and conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:
Describe the clinical features of patients presenting with DKA.
Discuss the safety of continuous insulin infusion use in noncritical care settings.

Self Assessment Questions:
Which of the following sign/symptoms is/are associated with diabetic ketoacidosis?
A: polydipsia
B: hypoglycemia
C: polyuria
D: a and c

Which of the following is/are precipitating factor(s) in diabetic ketoacidosis?
A: strict compliance with diabetes medication
B: pancreatitis
C: myocardial infarction
D: b and c

Q1 Answer: D Q2 Answer: D

ACPE Universal Activity Number 121-999-11-243 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
EVALUATION OF THE USE OF ANTIETEPILEPTIC DRUGS FOR SEIZURE PROPHYLAXIS IN PATIENTS WITH ANEURYSMAL SUBARACHNOID HEMORRHAGE, SPONTANEOUS INTRACEREBRAL HEMORRHAGE, AND TRAUMATIC BRAIN INJURY

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Purpose: Seizure prophylaxis is a common practice in patients with aneurysmal subarachnoid hemorrhage (SAH), spontaneous intracerebral hemorrhage (ICH), and traumatic brain injury (TBI). Since seizure episodes can be detrimental to these patients, appropriate initiation and monitoring of the prophylactic antiepileptic drug is very important while trying to prevent adverse events. The purpose of this study is to evaluate the appropriate use of antiepileptic drugs for seizure prophylaxis in patients with the above said conditions.

Methods: This study is a retrospective, single-centered, non-randomized chart review of patients admitted from September 2008 to September 2010 with a diagnosis of aneurysmal subarachnoid hemorrhage, spontaneous intracerebral hemorrhage, and traumatic brain injury. The primary objective is to evaluate the appropriate use of antiepileptic drugs for seizure prophylaxis including appropriate initiation, dosing and length of therapy. Also, any seizure episodes or readmission due to seizures at a result of inappropriate dosing/monitoring will also be assessed. The secondary objective is to look at adverse effects due to antiepileptic drugs that may lead to patient harm, prolonged hospital stay, or change in management. Based on available data, the benefits and risks associated with the use of these drugs will also be evaluated. The following data will be collected: patient age, gender, co-morbidities, type of brain injury, Glasgow Coma Scale score, number of seizure episodes if any, drug used for prophylaxis, dose and duration of drug, adverse drug reactions, reason for discontinuation or change in the drug, pertinent physical examination, vitals, lab values, EEG findings, if any, and readmissions due to seizures, if any. Provider documentation will also be reviewed to better understand the hospital course of patients. Based on collected data and results, recommendations in relation to seizure prophylaxis will be made.

Results/Conclusion: To be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Discuss the role of seizure prophylaxis in patients with aneurysmal subarachnoid hemorrhage, spontaneous intracerebral hemorrhage, and traumatic brain injury.
Identify areas for improvement in the management of seizure prophylaxis for patients with aneurysmal subarachnoid hemorrhage, spontaneous intracerebral hemorrhage, and traumatic brain injury.

Self Assessment Questions:
The most commonly used antiepileptic drug for seizure prophylaxis in patients with aneurysmal subarachnoid hemorrhage, spontaneous intracerebral hemorrhage, and traumatic brain injury is:

A Phenytoin
B Levetiracetam
C Carbamazepine
D Valproic Acid

Duration of seizure prophylaxis for patients with traumatic brain injury is:

A 3 days
B 5 days
C 7 days
D 14 days

Q1 Answer: A Q2 Answer: C

ACPE Universal Activity Number 121-999-11-309 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

ACCURATE ESTIMATION OF CREATININE CLEARANCE IN THE OBESE PATIENT

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Purpose:
Glomerular filtration rate (GFR) is considered to be the best indicator of renal function, and is approximated by creatinine clearance (CrCL). A number of equations exist to estimate CrCL. The primary objective of this study is to compare different methods of estimating CrCL and determine the equation and weight that most accurately estimates measured CrCL in obese patients. The secondary objective is to determine if the CrCL estimation methods result in non-optimal medication dosing for a panel of renally eliminated drugs.

Methods:
This prospective, observational study has been approved by the Institutional Review Board. Prior to study enrollment, all patients provided informed consent. The electronic medical record (EMR) was used to identify patients ages 18 to 89 with a body mass index greater than 30 kg/m2 and expected length of stay greater than 24 hours. Patients with factors related to unstable renal function, pregnancy, lactation, current treatment with nephrotoxic drugs or drugs that inhibit the secretion of creatinine were excluded. A 24-hour urine collection and serum creatinine measurement were obtained to determine measured CrCL. For equations that require a weight, actual, ideal, lean, and adjusted (30% and 40%) body weights will be used. These data will be used in the Cockcroft-Gault, Jelliffe, MDRD4, and Salazar-Corcoran equations to estimate CrCL. Estimations of CrCL will be compared using one-way analysis of variance with repeated measures, followed by pairwise testing methods if a difference is detected. For the secondary outcome, estimations of CrCL will be used to generate recommended doses for the panel of renally eliminated drugs and will be evaluated as "optimal" or "non-optimal", compared to doses determined by the measured CrCL. These categories will be evaluated using Fishers Exact test or Chi Square test for a significant difference.

Results:
Patients are currently being recruited. Results will be presented.

Learning Objectives:
Review the available literature for estimating renal function in obese patients.
Discuss the significance of accurately estimating renal function in obesity.

Self Assessment Questions:
Which of the following has been defined as a classification of obesity?

A BMI > 20 kg/m
B 1.4*IBW
C BSA > 1.73 m2
D BMI > 25 kg/m

What factors may contribute to inaccurate medication dosing in obesity?

A Changes in volume of distribution
B Changes in renal clearance
C Changes in hepatic clearance
D All of the above

Q1 Answer: B Q2 Answer: D

ACPE Universal Activity Number 121-999-11-399 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5
ANALYSIS OF THE REVERSIBILITY OF TENOFOVIR-ASSOCIATED RENAL DYSFUNCTION IN PATIENTS FOLLOWING DISCONTINUATION OF TENOFOVIR

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PURPOSE: Tenofovir disoproxil fumarate (TDF) is a commonly prescribed oral nucleotide reverse transcriptase inhibitor (NRTI) with activity against HIV-1, HIV-2, and HBV. The NRTI is currently listed as part of the preferred regimen for HIV-1 infection in both the Department of Health and Human Services (DHHS) and International AIDS Society (IAS) guidelines as a result of its limited side effect profile and superior efficacy over abacavir in patients with baseline HIV RNA levels greater than 100,000 copies/mL. Although tenofovir is generally well tolerated in clinical trials, renal dysfunction has been reported. With widespread use of tenofovir it is important to characterize the associated renal dysfunction and its expected resolution following a switch from tenofovir to an alternative NRTI (e.g. abacavir) in the general HIV population. The objectives of this study are to determine the reversibility of presumed tenofovir-associated renal dysfunction in a clinic cohort, the time for resolution of renal dysfunction following tenofovir cessation, and efficacy of alternative regimens.

METHODS: A retrospective chart review of adult HIV-infected patients with HLA-B*5701 results either as an outpatient (Ruth M. Rothstein CORE Center) or an inpatient (John H. Stroger Jr., Hospital of Cook County) will be conducted to identify patients that developed renal dysfunction from tenofovir-based regimens and were consequently switched to tenofovir-free regimens. Laboratory data including serum creatinine, estimated glomerular filtration rate (eGFR), urinalysis, HIV RNA viral load, and CD4 count will be collected at baseline prior to tenofovir initiation and at 3, 6, and 12 months following tenofovir cessation. Other variables examined will include pre-existing renal impairment, comorbidities, coinfection with hepatitis B or C, duration of tenofovir use, concomitant antiretrovirals, other nephrotoxic drugs administered, illicit drug use, and patient demographics, such as age, sex, and race.

RESULTS AND CONCLUSION: To be presented at the Great Lakes Pharmacy Residency Conference

Learning Objectives:
Describe the reversibility of presumed tenofovir-associated renal dysfunction (i.e. permanent, partially-reversible, fully-reversible). State the median time to maximum improvement of renal dysfunction.

Self Assessment Questions:
Which of the following has been associated with tenofovir-related renal dysfunction?
A: Fanconi Syndrome
B: Nephrogenic diabetes insipidus
C: Proximal tubulopathy
D: All of the above

The HLA-B*5701 test is used to predict hypersensitivity to which of the following agents?
A: atazanavir
B: amprenavir
C: tenofovir
D: abacavir

Q1 Answer: D  Q2 Answer: D

ACPE Universal Activity Number 121-999-11-358-L02-P
Activity Type: Knowledge-based  Contact Hours: 0.5

CLINICAL MANAGEMENT OF METABOLIC SYNDROME: DOES MENTAL ILLNESS IMPACT CARE?

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Purpose: The prevalence of metabolic syndrome (MS) in patients with schizophrenia or bipolar disorder may be twice that of the general population and treatment with atypical antipsychotics increases the risk of MS. Recent data suggests patients with schizophrenia are less likely to receive management of concomitant medical conditions. The purpose of this study is to determine if patients with mental illness are less likely to receive interventions for uncontrolled cardiovascular risk factors than a control population. We hypothesize that patients with severe mental illness will have fewer interventions and inferior care.

Methods: This is a retrospective cohort study. Medical records will be utilized to identify patients with MS and schizophrenia or bipolar disorder during 2008. Patients not receiving antipsychotic medication and at least one follow-up outpatient visit during 12 months after initiation will be excluded. This study will use a control group without mental illness for comparison of clinical interventions. A propensity score will be used to minimize the chance of inherent differences between groups. Baseline characteristics, abnormal lab values, interventions, provider type ordering monitoring and making interventions, and distance patient travels to facility will be recorded. Clinical interventions will be assessed for abnormal indices of blood pressure, glucose and lipids at the follow-up visit. The interventions may include initiation or dose adjustment of pharmacologic therapy (or switch/discontinuation of atypical antipsychotic in study group) in response to the abnormal lab value. We will identify the extent clinical inertia (the recognition of a problem, but failure to act) is present in the medical care of patients with mental illness and use these findings to develop better methods for the provision of quality care in our facility.

Results: Data collection in progress.

Conclusions: Conclusions to be presented.

Learning Objectives:
Review the importance of medical management with regards to cardiovascular risk factors in patients with severe mental illness, including Schizophrenia and Bipolar Disorder, being treated with an atypical antipsychotic.

Recognize an appropriate intervention in response to an abnormal laboratory value identified in patients with severe mental illness receiving an atypical antipsychotic.

Self Assessment Questions:
Which of the following is NOT a component of diagnosing metabolic syndrome?
A: Abdominal obesity
B: High LDL
C: Elevated blood pressure
D: Elevated fasting plasma glucose

Which of the following increases risk of developing metabolic syndrome and is often seen in patients with mental illness?
A: Treatment with atypical antipsychotics
B: Lifestyle
C: Biological factors
D: All of the above

Q1 Answer: B  Q2 Answer: D

ACPE Universal Activity Number 121-999-11-222-L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
Learning Objectives:
Identify methods for recognizing non-adherence to COPD medications and discuss possible intervention strategies.

Describe the impact of providing inpatient medication review and counseling on COPD-related hospitalizations and emergency department visits.

Self Assessment Questions:
Which of the following is defined as "the duration of time from initiation to discontinuation of therapy"?
A Compliance
B Adherence
C Consistency
D Persistence

Which combination of medications has demonstrated the greatest reduction of risk of COPD-related hospitalizations and emergency department visits?
A Long acting muscarinic antagonist + inhaled corticosteroid
B Long acting beta agonist + long acting muscarinic antagonist + inhaled corticosteroid
C Long acting beta agonist + long acting muscarinic antagonist
D Long acting beta agonist + inhaled corticosteroid

Results/Conclusion: Data collection is currently in progress. The results and conclusions of this study will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Identify methods for recognizing non-adherence to COPD medications and discuss possible intervention strategies.

Describe the impact of providing inpatient medication review and counseling on COPD-related hospitalizations and emergency department visits.

Self Assessment Questions:
Which of the following is defined as "the duration of time from initiation to discontinuation of therapy"?
A Compliance
B Adherence
C Consistency
D Persistence

Which combination of medications has demonstrated the greatest reduction of risk of COPD-related hospitalizations and emergency department visits?
A Long acting muscarinic antagonist + inhaled corticosteroid
B Long acting beta agonist + long acting muscarinic antagonist + inhaled corticosteroid
C Long acting beta agonist + long acting muscarinic antagonist
D Long acting beta agonist + inhaled corticosteroid

ACPE Universal Activity Number 121-999-11-152-L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
CLINICAL OUTCOMES IN PATIENTS RECEIVING A CARBAPENEM OR ALTERNATIVE TREATMENT FOR EXTENDED-SPECTRUM LACTAMASE PRODUCING ESCHERICHIA COLI OR KLEBSIELLA PNEUMONIA URINARY TRACT INFECTIONS SUSCEPTIBLE

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Purpose:
Escherichia coli and Klebsiella pneumoniae are major pathogens causing intra-abdominal infection, urinary tract infection (UTI), and primary bacteremia. Unfortunately, in many instances, antibiotic options are limited due to the production of extended-spectrum -lactamase (ESBL) enzymes. Carbapenems are currently considered the therapy of choice for infections caused by ESBL producing organisms. This recommendation is based on both in vitro data demonstrating almost uniform activity against ESBL producing organisms and clinical evidence showing carbapenems to be superior to cephalosporins and fluoroquinolones in the treatment of bacteremia. However, since carbapenems can only be administered parenterally, the use of an oral agent would be advantageous because it might allow for more convenient and cost-effective management of these infections. The purpose of this research project is to determine if oral therapy (fluoroquinolone, trimethoprim/sulfamethoxazole, or nitrofurantoin) is an appropriate selection for the treatment of a UTI caused by an ESBL producing E. coli or K. pneumoniae when cultures demonstrate in vitro susceptibility.

Methods:
This is a retrospective chart review of all inpatients at The Ohio State University Medical Center with a UTI caused by an ESBL producing E. coli or K. pneumoniae with in vitro susceptibilities to a fluoroquinolone, trimethoprim/sulfamethoxazole, or nitrofurantoin from January 1, 2007 to December 31, 2009. Clinical outcomes will be compared in patients treated solely with a carbapenem, with a therapy(s) other than carbapenem, or with a carbapenem to step-down appropriate oral therapy. Appropriateness will be assessed through the primary endpoint of infection recurrence and relapse rates. Secondary endpoints will include documented clinical resolution of the infection, 30 day rehospitalization rates, and length of stay.

Results:
Data collected will include demographic information, pertinent past medical history, urinalysis and culture results, antibiotic therapy, and clinical outcomes as described previously. Clinical outcomes are under investigation, with data collection and evaluation underway.

Learning Objectives:
Define extended spectrum beta lactamase.
Recognize appropriate antibiotic therapy for the treatment of an ESBL urinary tract infection.

Self Assessment Questions:
What is currently recommended as empiric therapy the treatment of an ESBL infection?
A: Aminoglycoside
B: Carbapenem
C: Extended spectrum cephalosporin
D: Fluoroquinolone

Which of the following is an example of a carbapenem?
A: Ciprofloxacin
B: Colistin
C: Ertapenem
D: Piperacillin/tazobactam

Q1 Answer: B Q2 Answer: C

IMPACT OF A LONGITUDINAL ACADEMIC EXPERIENTIAL PROGRAM ON TEACHING PRACTICES
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Purpose: More pharmacy jobs are requiring at least one year of residency for entry-level positions, including many faculty positions. The American Association of Colleges of Pharmacy Task Force on the Role of Colleges and Schools in Residency Training recommended in 2002 that postgraduate training be a requirement for faculty positions. In addition to the clinical experiences residencies provide, many sites have some teaching experiences incorporated throughout their programs. While studies exist which demonstrate influencing factors for residents decisions to pursue a career in academia, there are no studies describing the partnership of a college of pharmacy with area residency programs to provide teaching experiences and the impact of the program on residents career choices. The Butler University longitudinal academic experiential program (LAEP) partners with residency programs in the greater Indianapolis area to provide teaching experiences at a college of pharmacy. The purpose of this study is to describe the unique relationship of Butler College of Pharmacy and Health Sciences with local institutions to provide teaching experiences for local PGY1 and PGY2 residents as well as describe the impact of this program on residents career choice and teaching experiences in their current position.

Methods: This study is being conducted through survey research. We identified all participants in the LAEP between 2003-2009 via course syllabi. Email addresses were obtained from alumni records from program directors. Surveys were distributed via electronic mail. A cover letter was sent in the e-mail to explain the reasoning of the research and directions for completion of the survey. Returning the survey signifies each participants informed consent. Survey questions included descriptive questions and Likert-scale questions.

Results/Conclusions: Data collection is currently ongoing and will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Discuss a model for incorporating teaching experiences into a residency program.
Recognize the impact of a longitudinal teaching experience on career decisions.

Self Assessment Questions:
What is a positive factor that has been shown to influence a residents pursuit of an academic career?
A: Geographic location
B: Positive teaching experiences
C: Competitive salary
D: Adequate preparation

What is a teaching experience positively correlated with a residents acceptance of a faculty position?
A: Serving as primary preceptor for clerkship students
B: Serving as co-preceptor for clerkship students
C: Participation in a teaching certificate program
D: Completion of an academic rotation during residency

Q1 Answer: B Q2 Answer: A

ACPE Universal Activity Number 121-999-11-413-L04-P
Activity Type: Knowledge-based Contact Hours: 0.5
EVALUATION OF THE UNIVERSITY OF ILLINOIS MEDICAL CENTER HEPARIN PROTOCOL IN PATIENTS WITH CIRRHOSIS

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Purpose:
To evaluate whether application of the University of Illinois Medical Centers (UIMC) heparin dosing protocol results in overtanticoagulation in individuals with cirrhosis. In addition, an acceptable starting dose of heparin in this specific patient population will be determined in an effort to develop a specific heparin protocol to be utilized in cirrhotic patients.

Methods:
This study has been approved by the Institutional Review Board. This research will be a retrospective case-control review of electronic medical records. Adults greater than 17 years of age who have cirrhosis and who received heparin at UIMC from January 1, 2004 to October 1, 2010 may be included, as well as a comparison group of non-cirrhotic heparin treated adult patients within the same time period. Up to 100 cirrhotic subjects and 200 non-cirrhotic subjects may be included. Children 17 years of age and under and prisoners will be excluded from the study population. The primary endpoint will be the determination of a weight adjusted heparin rate that provides the institutions goal aPTT level in cirrhotic patients. Secondary outcomes include the average initial aPPT resulting from application of the current UIMC heparin protocol to cirrhotic and non-cirrhotic subjects, the time to therapeutic aPTT in both groups, and incidence of supra/subtherapeutic aPTT levels in both groups. Safety outcomes including bleeding events, new clot formation and reactions to heparin including heparin induced thrombocytopenia will be analyzed. Cirrhotic subjects who received heparin for portal vein clots will be evaluated to determine if the clots progressed or receded after initiation of anticoagulation therapy. All data will be recorded without patient identifiers and maintained confidentially.

Learning Objectives:
Describe the mechanism of action and indications for heparin use.
Review preliminary data assessing the anticoagulant effects of heparin in patients with cirrhosis.

Self Assessment Questions:
In liver disease, heparin has been associated with:
A Increased sensitivity and therefore possibly an increased risk of bleeding
B Altered disposition and pharmacokinetics to an unknown extent
C Altered binding due to a deficiency in antithrombin III.
D All the above.

In terms of dosing heparin for the treatment of VTE, the ACCP recommends:
A A bolus dose of 65 units/kg, followed by an intravenous infusion of...
B An altered dosing recommendation for patients with liver dysfunction...
C A bolus dose of 80 units/kg, followed by an intravenous infusion of...
D Against routine coagulation monitoring.

Q1 Answer: D Q2 Answer: C

THE REMEDY TO REMS: A PHARMACY TEAM INITIATIVE FOR INCREASED PATIENT SAFETY THROUGH MITIGATION STRATEGIES

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Background/Purpose: REMS (Risk Evaluation and Mitigation Strategies) was created by the FDA to serve as post-marketing surveillance to improve medication safety for patients on targeted medications. Our objective is to develop a formal process at Northwestern Memorial Hospital for identifying practical mitigation possibilities; this study will provide data on the need for monitoring, outcomes, and time commitment. The team will consist of pharmacists, residents, and students. Incorporation of students into a pharmacy team is an important segment in the Pharmacy Practice Model Initiative (PPMI). The PPMI describes students as being "agents of change" for the profession of pharmacy therefore including them as active participants of the mitigation team in this study coincides with professional pharmacy goals.

Methods: The FDA and ASHP REMS lists were consulted to review medications that might be included in this study. Exclusion criteria consisted of data from a 6 month retrospective review of drug use, purchasing trends, formulary status and mitigation possibilities were used to narrow the list of drugs studied to 6 medications. A "Mitigation Manual" was created with monitoring parameters, and full protocol for each medication. After formal training on how to use the mitigation manual and confirmation of understanding by the clerkship students, students will monitor patients using a daily generated report, assessing appropriateness of laboratory monitoring and of use. This concurrent report includes patients on specified medications. Using a standardized Excel template they will record physician and pharmacist interaction and act on discrepancies noted per protocol. The process will be reexamined and data will be evaluated for future development for policies or processes on REMS medications mitigation at NMH.

Learning Objectives:
Discuss the design and implementation of a REMS medication use surveillance protocol supported by an informatics generated report to identify patients on REMS medications to mitigate possible risk.
Recognize the importance of incorporating clerkship students into a Pharmacy Care Team congruent to Pharmacy Practice Model Initiative goals.

Self Assessment Questions:
Which of the following is true regarding REMS requirements?
A REMS requirements are the same for different REMS medications
B REMS requirements are different for different REMS medications.
C There is a consensus for REMS requirements for medications in the PPMI.
D There is a consensus for ETASU requirements for medications in the PPMI.

The best way to educate patients about safety risks for REMS medications is to:
A Staple a medication guide to a paper bag or hand the medication guide to the patient.
B Have a conversation with the patient regarding the medication.
C Have a pharmacy technician tell the patient to speak with their physician.
D Tell the patient to just do what their physician tells them to do.

Q1 Answer: B Q2 Answer: B

ACPE Universal Activity Number 121-999-11-457-L05-P
Activity Type: Knowledge-based Contact Hours: 0.5
EXPLORING OLD DRUGS FOR NEW BUGS: A COMPARISON OF MINOCYCLINE AND TETRACYCLINE SUSCEPTIBILITIES TO A. BAUMANNII

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Purpose: Multidrug-resistant Acinetobacter baumannii (MDR-AB) infections are difficult to treat due to the limited number of available antimicrobial agents. Historically, ampicillin/sulbactam and imipenem/cilastatin have been considered antimicrobials of choice for these infections. With reports throughout the literature of pan-resistant AB outbreaks, it is imperative to re-explore old antimicrobial options. Minocycline, a tetracycline derivative, has been shown to have in vitro activity against MDR-AB strains. Minocycline susceptibilities are not performed by most automated laboratory methods, which force the clinician to use tetracycline as a marker for minocycline susceptibility. The purpose of this study is to evaluate the correlation of tetracycline and minocycline susceptibility in MDR-AB.

Methods: Consecutive isolates of AB in respiratory and blood specimen from unique patients admitted between January 1, 2009 to December 31, 2009 were tested for tetracycline and minocycline susceptibilities using Etest. The identification and susceptibility of AB to ampicillin/sulbactam and confirmation of tetracycline resistance were performed by the MicroScan Walkaway system (Siemens Diagnostics Inc, CA). Imipenem/cilastatin, tigecycline, and colistin susceptibilities were tested using Etest. Inclusion criteria were isolates that showed multi-drug resistance defined as resistance to 2 or more of the following classes: antipseudomonal cephalosporins, antipseudomonal carbapenems, ampicillin/sulbactam, fluoroquinolones, and aminoglycosides. CLSI or FDA breakpoints were utilized for all drug susceptibilities. An IRB was approved by the local review board.

Results: A total of 116 isolates from 79 unique patients were identified. Sixty-seven isolates met inclusion criteria. Antibiotic susceptibilities were imipenem/cilastatin 6%, tigecycline 18%, ampicillin/sulbactam 25%, and colistin 99%. All 67 isolates were tetracycline resistant, and 32 (48%) were susceptible to minocycline. In 4 of 6 tigecycline-resistant isolates with MIC ≥ 6, minocycline remained fully susceptible.

Conclusion: Tetracycline susceptibilities do not predict minocycline susceptibility. Minocycline susceptibilities should be performed on all MDR-AB isolates regardless of susceptibility to tetracycline or tigecycline.

Learning Objectives:
Identify appropriate alternative antimicrobials for MDR-Acinetobacter infections.
Describe the pharmacokinetic and pharmacodynamic properties of minocycline.

Self Assessment Questions:
Which antimicrobial typically remains active in MDR- Acinetobacter baumannii?

A: Ertapenem
B: Ceftriaxone
C: Ciprofloxacin
D: Colistin

2) Which antimicrobial should be used with caution in MDR- Acinetobacter baumannii bloodstream infections due to poor serum levels?

A: Ampicillin/sulbactam
B: Imipenem/cilastatin
C: Colistin
D: Tigecycline

Q1 Answer: D  Q2 Answer: D

ASSESSING COMMUNITY PHARMACISTS PERCEPTIONS, UTILITY, AND BENEFITS OF FREE AND COMPREHENSIVE MEDICAL DATABASES BY THE NATIONAL LIBRARY OF MEDICINE (NLM) THROUGH PROMOTION OF AWARENESS AND EDUCATION

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Purpose: Community pharmacists are charged with the duty to provide exemplary care to patients and accurate drug information to healthcare professionals. Limited access to databases secondary to cost or unfamiliarity can hinder the accomplishment of this task. The National Library of Medicine (NLM) offers free access to a wide variety of databases which cover topics including drug information, household hazards, toxicology, chemistry, clinical studies, and genetic information. The provision of patient care and the pharmacists ability to provide accurate information to healthcare professionals will be furthered by increasing community pharmacists knowledge of these free resources.

Methods: This is a prospective, observational, open label, multi-site, cross-sectional, uncontrolled pilot study. Community pharmacies will be selected randomly by telephone. Fifty pharmacists who agree to participate will be given a pre-study questionnaire to determine their familiarity with NLM databases. Those who indicate they would like further training will be offered the option of training via written, in-person, or video materials. Once the training is complete, they will be given a post-training questionnaire. Primary outcomes evaluated will be the pharmacists perceptions and the utility of NLM databases. The secondary outcome will be the databases benefit to the pharmacists.

Results and Conclusions:
Data collection and analysis are in progress. Zoomerang software, face to face interviews, paper surveys received via fax, and emails will be analyzed in an Excel spreadsheet and reported. The investigators plan to use this data to persuade community pharmacies to allow their pharmacists to access these databases at their workplaces. Results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Recognize various free, comprehensive databases offered by the National Library of Medicine.
Identify factors that may obstruct community pharmacists ability to provide the most thorough care and drug information to patients and healthcare professionals.

Self Assessment Questions:
Which of the following accurately lists some of the available NLM databases?

A: Medline®, MedlinePlus®, and WebMD®
B: Medline®, MedlinePlus®, and ClinicalTrials.gov
C: ClinicalTrials.gov, Clinical Alerts, and MayoClinic.com
D: MayoClinic.com, MedlinePlus® and Clinical Alerts

Community pharmacists may have limited access to databases through their company or pharmacy software due to cost. What other factor is identified in this study as a major roadblock to thorough infor

A: Convenience of other databases
B: Unwillingness to use other databases
C: Awareness of other databases
D: Reliability of other databases

Q1 Answer: B  Q2 Answer: C

Activity Type: Knowledge-based  Contact Hours: 0.5

ACPE Universal Activity Number 121-999-11-379 -L04-P
IMPACT OF AN ANTIMICROBIAL STEWARDSHIP PILOT PROJECT FOR THE TREATMENT OF CANDIDIASIS ON PRESCRIBING PRACTICES, PATIENT OUTCOMES, AND COST

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BACKGROUND: Suboptimal use of antimicrobial agents can lead to unnecessary health care costs, resistance development, and patient exposure to medication. In January 2007, guidelines were published by the Infectious Disease Society of America (IDSA) for developing an institutional program to enhance antimicrobial stewardship. Antimicrobial stewardship includes ensuring the appropriate selection, dosing, route, and duration of antimicrobial therapy. In March 2009, clinical practice guidelines were published by the IDSA that provided an evidenced-based approach for treatment, dosing, and monitoring of patients who either have or are at risk of candidiasis.

PURPOSE: To evaluate the impact of pharmacists’ interventions on overall prescribing practices, patient outcomes, and cost when echinocandin therapy is deemed noncompliant with the IDSA guidelines

METHODS: This before-after study will evaluate the impact of pharmacists interventions as part of an antimicrobial stewardship pilot project. Data will be collected on all patients who received an echinocandin from August to December 2009 (control group) and August to December 2010 (study group). The control group represents patients that had no pharmacist monitoring or interventions while the study group represents patients that had pharmacist monitoring and interventions. Primary outcome measures include compliance with IDSA guidelines according to indication and antifungal agent selection, length of therapy, de-escalation of therapy if applicable, and acceptance of the pharmacist intervention when necessary. Secondary outcome measures will include whether pharmacist interventions influence length of stay, mortality, total cost of care, total pharmacy drug cost, echinocandin drug cost, and antifungal drug cost.

RESULTS/CONCLUSIONS: Data collection is in progress. Results will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Recall the basic tenets of antimicrobial stewardship programs.
Describe the interventions of a pharmacist on the treatment of candidiasis.

Self Assessment Questions:
Of the following, which is a core strategy of an antimicrobial stewardship program?
A Prospective audit with intervention and feedback
B Guidelines and clinical pathways
C Parenteral to oral conversion
D Dose optimization

For the treatment and management of patients with candidiasis, which one of the following is true?
A The use of echinocandin antifungals is not evidence-based
B The use of fluconazole is not recommended for most patients
C Selection of empiric therapy could be guided by local albicans to n
D It is acceptable to wait on species identification to initiate antifungals

Q1 Answer: A     Q2 Answer: C

SAFETY AND EFFICACY OF DALTEPARIN PRESCRIBING IN AN ACADEMIC MEDICAL CENTER FOR THE TREATMENT AND PREVENTION OF VENOUS THROMBOEMBOLISM IN OBESE PATIENTS

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Purpose: Limited studies have evaluated dalteparin dosing in obese patients. The purpose of this study is to evaluate the relationship between anti-Xa levels and dalteparin dosing for venous thromboembolism (VTE) treatment and prophylaxis in obese patients.

Methods: A retrospective, single center, nonrandomized, cohort design will be utilized. Electronic medical records will be used to identify patients and collect data over a twelve month period. Patients will be included in the study if they were at least 18 years of age, had a body mass index (BMI) >30kg/m2, and received dalteparin, and had at least one anti-Xa level drawn during their admission. Patients will be excluded if their anti-Xa level was drawn less than 3 hours or greater than 6 hours after a dose of dalteparin or was drawn prior to the third dose of dalteparin. Data on patients age, gender, renal function, and comorbidities will also be obtained. Additional pertinent data will be collected on readmission rates and adverse events including hemorrhagic complications and thrombotic events. Patients included in the study will be categorized based on whether they received VTE treatment or prophylactic doses of dalteparin. For the purpose of this study the goal anti-Xa ranges are: 0.2 to 0.5 IU/mL for VTE prophylaxis; 0.6 to 1.0 IU/mL for patients receiving twice daily VTE treatment dosing; and 1.0 to 2.0 IU/mL for patients receiving once daily VTE treatment dosing. Anti-Xa levels will be compared with the dose of dalteparin that was prescribed. The primary outcome will be the percent of obese patients who received VTE therapeutic or prophylactic dosing of dalteparin and achieved an anti-Xa level within the goal range. Secondary outcomes will include adverse events and readmission rates.

Results: Data analysis is currently being conducted. Results and conclusions will be presented at the Great Lakes Conference.

Learning Objectives:
Discuss if the maximum daily dose of dalteparin according to the package insert is appropriate for the treatment of venous thromboembolism in obese patients.
Discuss the correlation between dalteparin dose received and anti-Xa level result in obese patients receiving either venous thromboembolism treatment or prophylaxis.

Self Assessment Questions:
According to the package insert, for the treatment of symptomatic venous thromboembolism, the total daily dose of dalteparin should not exceed:
A 15,000 IU
B 18,000 IU
C 25,000 IU
D 28,000 IU

Which of the following statements is true regarding obese patients who received 18,000 units of dalteparin daily for the treatment of venous thromboembolism?
A A majority of obese patients who received 18,000 units daily had a
B A majority of obese patients who received 18,000 units daily had a
C A majority of obese patients who received 18,000 units daily had a
D Fifty percent of obese patients who received 18,000 units daily had a

Q1 Answer: A     Q2 Answer: C

PATIENTS

Academic Medicine Center for the Treatment and Prevention of Venous Thromboembolism

ACPE Universal Activity Number 121-999-11-195 -L01-P
Activity Type: Knowledge-based     Contact Hours: 0.5

ACPE Universal Activity Number 121-999-11-279 -L01-P
Activity Type: Knowledge-based     Contact Hours: 0.5
DEVELOPMENT OF A PROCEDURAL SEDATION PROTOCOL FOR NEONATAL INTENSIVE CARE UNIT PATIENTS IN THE RADIOLOGY DEPARTMENT
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BACKGROUND: Patients in the Neonatal Intensive Care Unit (NICU) often undergo painful and non-painful procedures in the radiology department (RD). It is difficult to assess whether these patients receive adequate procedural sedation as there is a lack of an accepted sedation assessment tool for this patient population. There is not a formal standardized procedural sedation protocol in place at our institution for these patients. In order to prevent medication errors and ensure a high level of safe medication use, it is necessary to standardize all medications that are given to NICU patients for procedures in the RD due to the diversity of our NICU patient population and diversity of their procedures.

PURPOSE: Characterize past use of sedation agents in NICU patients who underwent procedures in the RD and design a standardized procedural sedation protocol to meet the sedation needs of these patients.

METHODS: Retrospective, chart-review of NICU patients who have undergone procedures in the RD. Patients will be identified through ICD-9 procedural codes. Procedures will be divided into two categories which include painful procedures such as placement of peripherally-inserted central catheters and wound drainage, as well as non-painful procedures such as MRI and CT scans. The use of all sedation agents for procedures done in the RD in these patients will then be evaluated and assessed for the appropriateness of indication, dosing, effectiveness and any potential adverse effects. Sedation practices will be characterized using descriptive statistics. Using data from this chart-review, a standardized procedural sedation protocol including a step-wise algorithm will be developed for all NICU patients who undergo procedures in the RD.

RESULTS AND CONCLUSIONS: Results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
List common procedures that NICU patients undergo in the radiology department.
List common pharmacological agents that are used in NICU patients who undergo procedures in the radiology department.

Self Assessment Questions:
Which of the following are common procedures that NICU patients undergo in the radiology department?
A: Central catheter placement
B: Wound drainage
C: MRI of the brain
D: All of the above
Which of the following are pharmacological agents commonly used in NICU patients who undergo procedures in the radiology department?
A: Oral midazolam
B: Chloral hydrate
C: Oral lorazepam
D: All of the above
Q1 Answer: D Q2 Answer: D

USE OF INVASIVE PROCEDURES TO CULTURE MICROBIOLOGIC FLORA IN PATIENTS WITH PNEUMONIA: A RETROSPECTIVE STUDY
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Purpose
The primary purpose of this study is to examine microbiological flora in patients in the critical care setting at Bronson Methodist Hospital. Secondary endpoints will include examining antibiotic changes occurring after the positive invasive culture is performed and comparing risk factors for each of the most prevalent organisms.

Methods
This is a retrospective study in which patients were gathered between the dates of January 2009 to June 2010. Patients with pneumonia were examined with bronchoalveolar lavage cultures (BAL) or protected micro-brush samples, also known as invasive cultures, in the critical care setting. All of the 100 patients included in this study had a positive invasive culture, showing a growth of greater than 50,000 colony forming units per milliliter. The patients BAL cultures or protected micro-brush samples were analyzed to reveal the most common organisms. Additionally, factors contributing to patients risk for developing certain types of pneumonia within the critical care setting at Bronson Methodist Hospital were found.

Summary of preliminary results to support conclusion
Currently, Bronson Methodist Hospital has a pneumonia order set which includes a pre-set list of antibiotics to choose from, depending on whether the patient has community acquired or healthcare associated pneumonia. The most common organisms found in this study were Haemophilus influenza, Streptococcus pneumonia, Methicillin-Sensitive Staphylococcus aureus (MSSA) and Pseudomonas aeruginosa. This study shows the importance of a pneumonia order set and demonstrates methods of improving the list of antibiotics on the order set allowing therapy to be guided appropriately. With the conclusion of this study, implications will be made to have a pneumonia protocol to cover the most common organisms at Bronson Methodist Hospital.

Conclusions reached
Further analysis and conclusions will be presented at the Great Lakes Pharmacy Resident Conference in April 2011.

Learning Objectives:
Indicate the most common organism found in the critical care setting at Bronson Methodist Hospital.
Select the most appropriate empiric antibiotic regimen for patients diagnosed with pneumonia at Bronson Methodist Hospital.

Self Assessment Questions:
What was the most common organism seen in the critical care setting for patients with pneumonia at Bronson Methodist Hospital?
A: Methicillin-Resistant Staphylococcus aureus (MRSA)
B: Stenotrophomonas maltophilia
C: Pseudomonas aeruginosa
D: Streptococcus pneumoniae

With a patient with healthcare associated pneumonia at Bronson Methodist Hospital, what would be the best empiric therapy?
A: Piperacillin-tazobactam and tobramycin
B: Piperacillin-tazobactam
C: Cefepime and tobramycin
D: Piperacillin-tazobactam, tobramycin and vancomycin

Q1 Answer: D Q2 Answer: D

ACPE Universal Activity Number 121-999-11-187 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

ACPE Universal Activity Number 121-999-11-161 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
CONTINUOUS QUALITY IMPROVEMENT OF A PHARMACIST-MANAGED INPATIENT ANTICOAGULATION SERVICE
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Purpose: The Joint Commission National Patient Safety Goals (NPSGs) include elements of performance designed to reduce the likelihood of patient harm associated with the use of anticoagulants, including warfarin. In March, Aurora’s Medical Center in Grafton, WI will pilot a pharmacist-managed inpatient anticoagulation service for the Aurora Health Care System. The purpose of this project is to evaluate anticoagulation safety in the context of the anticoagulation NPSGs, take action to improve practices, and measure the effectiveness of those actions.

Methods: Continuous quality improvement is necessary to ensure that the protocol is safe and effective, and to assess pharmacist adherence to the protocol. To evaluate protocol safety, we will screen for patients with an international normalized ratio (INR) greater than 4.5. This will estimate the overall number of potentially dangerous high values. To evaluate protocol efficacy, we will perform chart audits to determine time in therapeutic range (for patients already on warfarin) or time to therapeutic range (for patients initiating warfarin). To evaluate pharmacist compliance with protocol, we will perform chart audits to determine whether pharmacists contact physicians for INR greater than four, initiate therapy at correct doses, address drug-drug interactions, and adjust doses appropriately based on daily INR values. Safety and efficacy indicators will be measured prior to and after protocol initiation. Based on the comparison of these values, and the level of pharmacist adherence to protocol parameters, we will identify areas where improvement is necessary. For each indicator targeted for improvement we will recommend protocol modifications or develop educational materials, as appropriate. Once changes have been implemented, we will reevaluate metrics to determine whether the protocol and subsequent modifications are having their intended effect and to continually highlight new areas for improvement.

Results/Conclusions: Data collection is in progress; results and conclusions will be presented at Great Lakes Residency Conference.

Learning Objectives:
Explain the Joint Commission’s national patient safety goal for institutions to evaluate and improve processes for safe anticoagulant use.
Describe parameters that can be used to evaluate safety and efficacy of warfarin use in an inpatient setting.

Self Assessment Questions:
Which of the following parameters best measures protocol efficacy
A Initial dose
B INR on day 6
C Number of interacting drugs present on profile
D Goal INR range

The Joint Commission’s National Patient Safety Goals relating to the use of warfarin require:
A Initial dosing should start at 5 mg
B Pharmacist should dose all inpatient warfarin patients
C INRs must be drawn for each patient daily
D Quality improvement of warfarin use must be performed

Q1 Answer: B Q2 Answer: D

MILRINONE VERSUS DOBUTAMINE: ARRHYTHMOGENIC POTENTIAL IN CRITICALLY ILL PATIENTS
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Purpose: Outcomes data supporting the use of inotropic therapy with dobutamine and milrinone in critically ill patients are lacking. Despite this, many critically ill patients are treated with inotropic therapy for conditions such as decompensated heart failure and severe sepsis. Current literature provides inconclusive evidence regarding whether or not inotropic support improves survival or other outcomes such as length of stay in the intensive care unit (ICU). Rather, inotropic therapy may cause deleterious adverse effects including life-threatening arrhythmias. In addition to the lack of supporting data, it is unclear if one inotrope is preferred over another in terms of arrhythmogenic potential. The objective of this study is to investigate the incidence of arrhythmias in critically ill patients treated with either milrinone or dobutamine in order to better understand the clinically significant adverse effects associated with the administration of these agents.

Methods: A retrospective chart review from January 2007 - December 2010 was conducted to identify patients admitted to the intensive care unit (ICU) at Harper University Hospital who received either milrinone or dobutamine. Demographic data was collected on each patient upon ICU admission. Daily ECG rhythm strips were evaluated to determine the presence of tachyarrhythmias and ICU flow sheets were reviewed for documentation of significant hemodynamic changes requiring intervention. Tachyarrhythmias were defined as an increase in HR of >20 beats per minute, a rise of >20% from baseline, or any event leading to interruption or discontinuation of therapy. Clinically significant hemodynamic changes were considered hypotension, defined as SBP <80mmHg or a decrease in MAP of >25% from baseline lasting for >30 minutes and requiring intervention.

Results: Data collection will be completed in February, and will be compiled for presentation at the 2011 Great Lakes Pharmacy Resident Conference.

Conclusions: To be presented at the 2011 Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Identify the role of inotropic therapy in sepsis and acute decompensated heart failure.
Discuss the concerns with using inotropic therapy in critically ill patients.

Self Assessment Questions:
The goal in using inotropic therapy in severe sepsis and acute decompensated heart failure is to
A Improve tissue hyperperfusion through increasing cardiac output
B Improve tissue hyperperfusion through decreasing cardiac output
C Reduce tissue perfusion through increasing cardiac output
D Reduce tissue perfusion through decreasing cardiac output

Dobutamine and milrinone are associated with
A Bradyarrhythmias
B Tachyarrhythmias
C Hypotension
D B & C

Q1 Answer: A Q2 Answer: D

Activity Type: Knowledge-based Contact Hours: 0.5
IMPACT OF EARLY INITIATION OF METHADONE IN TRAUMA PATIENTS REQUIRING MECHANICAL VENTILATION

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Background: Numerous studies have identified strategies to reduce mechanical ventilation time by targeting an appropriate level of sedation and limiting use of continuous intravenous (CIV) sedatives. However, applicability of these strategies to trauma patients has not been established. At our medical center, methadone, a mu-opioid receptor agonist and NMDA receptor antagonist, is used in the management of trauma and burn patients to treat acute pain, limit the development of opioid tolerance, and reduce CIV sedative use. The purpose of this study is to evaluate the impact of early initiation of methadone on the number of ventilator-free days in trauma patients admitted to the intensive care unit (ICU).

Methods: This is a single-center, retrospective cohort study comparing clinical outcomes of trauma and burn patients who received early methadone (EM) to control patients who did not receive methadone while mechanically ventilated. The primary outcome is the number of ventilator-free days in a 28-day period. Secondary outcomes include ICL and hospital length of stay, number of oral morphine equivalents and hypnotic medications administered during mechanical ventilation, and development of ventilator-associated pneumonia and QTc prolongation. ICU patients between 18 - 89 years of age who required mechanical ventilation were included for evaluation. Pregnant patients, inmates and patients treated with methadone prior to admission were excluded. Patients who received methadone within the first 96 hours of intubation and remained mechanically ventilated for 48 hours after the first dose were included in the EM group. Propensity score matching based age, injury severity scale score, and type of trauma was used to select control group patients. An optimal matching algorithm was used to match three controls to each EM patient. Ventilator-free days was compared by a Wilcoxon rank sum test. Data was collected on patients until discharge from the ICU or 28-days.

Summary/Conclusions: Data collection and evaluation is currently in progress.

Learning Objectives:
Discuss appropriate strategies to reduce duration of mechanical ventilation in critically ill patients.
Recognize the rationale for using methadone to limit the development of opioid tolerance and reduce sedative use.

Self Assessment Questions:
Which of the following occurs as a result of the administration of methadone?
A: Agonist activity at kappa-opioid receptors
B: Agonist activity at NMDA receptors
C: Antagonist activity at NMDA receptors
D: Antagonist activity at mu-opioid receptors

Which of the following potential serious adverse effect of methadone?
A: Renal failure
B: Hepatic failure
C: QTc Prolongation
D: Atrial fibrillation

Q1 Answer: C  Q2 Answer: C

RISK FACTORS FOR ISOLATION OF DAPTOMYCIN-RESISTANT, VANCOMYCIN-RESISTANT ENTEROCOCCUS

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Purpose: In clinical practice, daptomycin is sometimes considered as a treatment option for daptomycin-resistant enterococcus. A potential cause for concern in antimicrobial stewardship is the development of daptomycin-resistant, vancomycin-resistant enterococcus (DRVRE). A number of cases of colonization or infection with these organisms have been observed within our health system. Although several case reports of daptomycin treatment failure of enterococcus have been written, there have not been any published risk factor studies for DRVRE. The objective of this study is to identify risk factors for daptomycin resistant VRE isolates.

Methods: This study is a retrospective analysis using a case-case control design. The resistant case group includes cases of DRVRE, the sensitive case group includes cases of daptomycin sensitive VRE, and the control group includes patient cases not infected by Enterococcus spp. Patient data was retrieved using the electronic medical record of our institution. Age of at least 18 years and any positive culture for enterococcus (or another organism for the control group) between January 1, 2008 and December 31, 2009 comprise the inclusion criteria. Patients with duplicate isolates or positive enterococcal rectal swabs in the absence of other enterococcal isolation are excluded. In concordance with CLSI breakpoints, daptomycin resistance is defined as any enterococcal species with a daptomycin MIC > 4 g/mL. Risk factors examined include demographic data such as age, sex, race and admission from a long term care facility; admission to different services or units of the hospital; co-morbidities and concomitant medications; previous hospital or health care institution exposure; and prior and concurrent antibiotic use.

Results/conclusions: This research is in progress. Results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Define daptomycin-resistant, vancomycin-resistant enterococcus and identify appropriate treatment options for this pathogen.
List the risk factors identified in this study for isolation of daptomycin-resistant enterococcus.

Self Assessment Questions:
What is the breakpoint for daptomycin MIC breakpoint for enterococcus:‘
A: 1
B: 2
C: 4
D: 8

Which of the following may be appropriate treatment options for daptomycin-resistant, vancomycin-resistant enterococcus?
A: Vancomycin
B: Linezolid
C: Cefepime
D: Aztreonam

Q1 Answer: C  Q2 Answer: B

ACPE Universal Activity Number 121-999-11-185-L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
AN ANALYSIS OF THE USE OF HEPARIN AND BLEEDING RATES A’ THE OHIO STATE UNIVERSITY MEDICAL CENTER
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Purpose: Currently the Ohio State University Medical Center (OSUMC) utilizes different heparin dosing regimens; each intended for a specific indication. Dosing regimens vary by inclusion of an initial bolus dose, dose of initial bolus (if included), initial rate of infusion, and location available for ordering from the Computerized Physician Order Entry system. Multiple dosing regimens may result in inappropriate ordering of heparin leading to potential bleeding events. This medication use evaluation examined the use of heparin at the OSUMC and identified bleeding rates in the institution. The primary objective was to define the use of heparin dosing protocols according to indication. Additionally, this evaluation analyzed the rate of potential and actual bleeding events by protocol.

Methods: A retrospective chart review of a random sample of patients who were charged for at least two premixed bags of heparin 25,000 units/250ml in 5% Dextrose from March 1, 2008 to December 31, 2008 was conducted. Data collected includes the heparin dosing protocol ordered, demographic data, indication for heparin, aPTT values and bleeding events. Potential bleeding events were defined as an aPTT value >100. Actual bleeding events were defined as the occurrence of one of the following: a decrease in hemoglobin (Hgb) of ≥ 3 g/dL; the need for transfusion of packed red blood cells during heparin therapy or 24 hours after discontinuation; and documentation of heparin discontinuation due to bleeding. The study protocol was approved by The Ohio State University Institutional Review Board. Data will be analyzed using descriptive statistics.

Results: Data collection and analysis are ongoing. Final results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Describe the mechanism of action of unfractionated heparin (UFH) and its effects on the clotting cascade.
Identify evidence-based dosing guidelines for UFH.

Self Assessment Questions:
Which of the following is the CHEST recommended initial dosing of UFH for a patient that presents with a DVT?
A 60 Units/kg bolus + 12 Units/kg/h infusion
B 80 Units/kg bolus + 18 Units/kg/h infusion
C No bolus + 12 Units/kg/h infusion
D 80 Units/kg bolus + 16 Units/kg/h infusion

UFH inhibits the following components of the coagulation cascade:
A Thrombin, Antithrombin III, and Fibrin
B Factors II, IX, X, XI, and XII
C The Extrinsic and Common Final Pathway
D Factors IIa, IXa, Xa, and XIIa

Q1 Answer: B Q2 Answer: D

IMPACT OF AN INTERDISCIPLINARY HOSPICE TEAM IN REDUCING USE OF NON-PALLIATIVE MEDICATIONS
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Purpose: In February 2010, a hospice team consisting of a physician, a nurse practitioner, a hospice coordinator, and other healthcare personnel was established at the Edward Hines, Jr. VA Hospital. The main goal of the hospice team is to effectively provide consistent quality care and symptom management to hospice patients while also providing emotional and psychosocial support. Reducing the number of non-palliative medications plays a role in this philosophy by reducing risk for drug related problems and improving the overall quality of life in this frail and vulnerable population. For hospice patients with a life expectancy of less than six months, adverse events with these medications likely outweigh the potential benefits. The primary purpose of this study is to determine the impact of a newly created interdisciplinary hospice team in reducing the number of non-palliative medications for patients admitted to hospice care. The average number of non-palliative and scheduled medications at various time points will be investigated.

Methods: Patients admitted to the hospice and palliative care team from January 1, 2009 through December 31, 2010 will be reviewed. Patients admitted from January 1, 2009 to January 31, 2010 will serve as the control group to be compared to those admitted after February 1, 2010 under the care of the newly created hospice team. The two groups of data will be randomized and the first 70 patients in each group will be evaluated for analysis based on our power calculation. Patients who die within 48 hours of admission to hospice care or patients who were not followed by the VA just prior to admission to hospice care will be excluded. Baseline characteristics and all data collected will be determined by retrospective chart review.

Results: Data collection in progress. Results and conclusions to be presented at Great Lakes Conference.

Learning Objectives:
Describe the use of non-palliative medications and scheduled medications in hospice patients in the VA setting.
Discuss how an interdisciplinary hospice team may improve quality of life in hospice patients.

Self Assessment Questions:
Which medications are most frequently listed as “high alert” on the Institute for Safe Medication Practices Report?
A Warfarin and Metformin
B Insulin and Heparin
C Morphine and Amoxicillin
D Glyburide and Digoxin

According to the study conducted at the Pittsburgh VA, what type of medication was classified as unnecessary?
A Vitamins
B Antihypertensive agents
C Chemotherapy agents
D Cholesterol lowering agents

Q1 Answer: B Q2 Answer: A

ACPE Universal Activity Number 121-999-11-089 - L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
Background:
It is estimated that nearly 20% of patients who are discharged from the hospital will experience an adverse event (AE), and that over 60% of those AEs are the result of drug related problems (DRPs). In review of post-discharge DRPs, it has been determined that nearly 50% could have been prevented. During the first few weeks following hospital discharge, a number of medication changes are often made to a patient regimen. Complicating this picture is the new host of barriers a patient must overcome, including inadequate follow-up, monitoring, and continuity of care. This results in sub-optimal medical management and adherence issues. This study will document the contributions of a clinical pharmacist to a nurse practitioner (NP) post-discharge clinic, in an attempt to reduce DRPs and improve medication outcomes following an acute illness.

Objectives/Purpose:
The primary objective is to describe the services and recommendations made by the pharmacist and the acceptance rates of those recommendations. The secondary objective is to describe the medication discrepancies found between hospital discharge summaries and home medications.

Methods:
This is a prospective study in an urban community health center. All data will be collected during an eight week time span. Patients who have been discharged from the hospital or the emergency department (ED) presenting for their first post-discharge follow up appointment with the NP will be included. The pharmacist will obtain the patients medication history, making note of any discrepancies as compared to the patients discharge summary. The pharmacist will also review the list to determine if there are any potential DRPs. Recommendations will be provided to the NP and acceptance rates will be documented. The pharmacist will then provide and document any additional services that the patient requires.

Results/Conclusions:
Data collection is currently in progress.

Learning Objectives:
Identify the prevalence of adverse drug events that patients experience following a discharge from a hospital or emergency department. Indicate the extent of drug events that are potentially preventable in patients recently discharged from the hospital or emergency department.

Self Assessment Questions:
What percentage of patients who experience an adverse event following a hospital/ED discharge present with an adverse drug event?
A: 5%
B: 15%
C: 30%
D: 60%

What percentage of adverse drug events following a hospital/ED discharge could have been prevented?
A: 75%
B: 50%
C: 25%
D: 10%

Q1 Answer: D  Q2 Answer: B

ACPE Universal Activity Number 121-999-11-252 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
The Influence of Education and Experience in Minimizing Pharmacist Insecurity During Code Blue

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Purpose: The leading cause of death among adults over age 40 is sudden cardiac arrest. The CDC reports that 36.1% of sudden cardiac arrests occur in hospitals. The first formal report of a pharmacist attending a CPR event was documented in the 1970s. Studies have shown pharmacist participation in a code increases compliance with ACLS guidelines. Currently at Norton Healthcare, pharmacists at three of the adult facilities attend codes, but pharmacists at one adult facility do not attend codes. Pharmacists at that facility have expressed insecurity in their attendance during codes. The purpose of this study is to evaluate the influence of education and experience in minimizing pharmacist insecurity during code blue.

Methods: All pharmacists currently working at an adult facility for Norton Healthcare were asked to complete a baseline survey assessing comfort level attending a code and knowledge about medications used in a code. Background information collected included how long they have been working in a hospital, number of codes attended, and BLS or ACLS certification. Pharmacists completed a pharmacist specific education module covering ACLS guidelines and medications commonly used during a code. After education, a post survey identical to the baseline survey was administered to all pharmacists. Pharmacists were grouped based on experience and were evaluated on the study variables. Experience is defined as attending 4 codes in the past 18 months or attending codes continuously in the preceding 5 years. Statistics will include t-tests and repeated measures design analysis of variance. Results/Conclusion: Final results and conclusion will be presented at the Great Lakes Pharmacy Resident Conference in April 2011.

Learning Objectives:
Describe the potential impact pharmacists can have by attending codes. Explain how education and experience can potentially affect pharmacist comfort level while attending codes.

Self Assessment Questions:

Which of the following roles is a pharmacist qualified to perform during a code?
A preparation of medications
B: providing drug information
C: documentation of medications administered
D: all of the above

The best way to minimize a pharmacist’s insecurity while attending codes is
A education
B: experience
C: both
D: neither

Q1 Answer: D Q2 Answer: C

Impact of Gabapentin Initiation in Patients with Chronic Heart Failure: A Pre-Post Retrospective Comparison

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Purpose
Peripheral edema and fluid accumulation secondary to medication therapy is associated with worsening chronic heart failure (CHF). Gabapentin has been shown to cause increased peripheral edema (1.7-8.3%), but the safety of its use in patients with CHF is unknown. In contrast, pregabalin, which is structurally related to gabapentin, is also associated with peripheral edema (5-12%), but has numerous case reports of worsening heart failure in patients initiating pregabalin therapy. This issue is particularly concerning because CHF is a common comorbidity of diabetes, and gabapentin is frequently prescribed for the treatment of diabetic neuropathy. Because gabapentin has not been extensively studied in a CHF population, the clinical implications of gabapentin-induced peripheral edema are unknown. The objective of this study was to determine whether the initiation of gabapentin in heart failure patients worsens CHF symptoms or increases the number of hospitalizations due to heart failure exacerbations.

Methods
Prior to commencement, this study was approved by the Institutional Review Board for approval. The study was conducted as a retrospective cohort study. The electronic medical record system was used to identify patients with a history of a hospitalization for CHF (based on ICD-9 admission codes) who were prescribed gabapentin at least six months after their first documented CHF admission. Patients younger than 18 years old, patients taking pregabalin, or patients with end-stage renal disease on hemodialysis were excluded from the study. Patients meeting inclusion criteria were retrospectively observed for six months prior to initiation of medication, and six months following initiation of medication. Data collection occurred at the initiation of gabapentin therapy, and at each hospitalization. Data analysis compared the frequency and severity of CHF hospitalizations prior to and following gabapentin therapy.

Results/Conclusion
Data collection for this study is ongoing. Conclusions will be assessed following data collection and analysis.

Learning Objectives:
Describe the theoretical risk of gabapentin therapy in patients with chronic heart failure. Discuss the current level of evidence related to gabapentin worsening heart failure symptoms.

Self Assessment Questions:
What is the theoretical risk of gabapentin therapy in patients with chronic heart failure?
A Gabapentin directly decreases cardiac inotropy, thereby worsening heart failure
B: Gabapentin is associated with fluid accumulation, which may exacerbate heart failure
C: Gabapentin is associated with a significant drug interaction with furosemide
D: Gabapentin is generally a benign drug with little or no theoretical risk

What is the current level of evidence implicating gabapentin for worsening heart failure?
A Gabapentin has been poorly studied in patients with chronic heart failure
B: Gabapentin has been extensively studied in a chronic heart failure population
C: Gabapentin has been extensively studied in a chronic heart failure population
D: Retrospective analysis has shown a trend towards increased hospitalization

Q1 Answer: B Q2 Answer: A
Purpose: Patients with renal impairment may have increased anti-Xa levels due to the accumulation of enoxaparin when using manufacturer-recommended dosing. The manufacturer does not outline utilizing anti-Xa levels to achieve therapeutic anticoagulation for patients with moderate renal impairment. However, the American College of Chest Physicians guideline recommends targeting anti-Xa levels between 0.6 to 1 unit/mL, in order to achieve therapeutic anticoagulation in patients with renal impairment. The purpose of this study is to evaluate the relationship between anti-Xa levels and creatinine clearance (CrCl) in patients with moderate renal impairment using the manufacturer-recommended treatment dose of enoxaparin 1 mg/kg subcutaneously every 12 hours.

Methods: This prospective observational and retrospective study will be conducted from May 1, 2010 through May 31, 2011. Adult patients at the University of Chicago Medical Center (UCMC) will be included for evaluation if receiving treatment doses of enoxaparin and have a CrCl between 30 and 59 mL/min. Patients will be excluded if they have a history of heparin-induced thrombocytopenia, contraindication to heparin or heparin-derivatives, plateau count less than 50,000 per microliter, pregnancy, or acute kidney injury. Utilizing electronic and paper records, data collection will include indication, age, gender, height, weight, serum creatinine, administration times, doses, anti-Xa levels, and adverse events related to bleeding or thrombosis. Anti-Xa levels will be drawn between 3 and 5 hours after the enoxaparin dose at steady-state. Therapeutic anticoagulation will be defined as an anti-Xa level of 0.6 to 1 unit/mL. Dose adjustments will be made to achieve therapeutic goals per the UCMC enoxaparin protocol. CrCl will be estimated using the Cockcroft-Gault method per UCMC enoxaparin protocol. A targeted sample size of 42 patients will be collected in order to achieve 80 percent power. Descriptive statistics will be used to analyze the data.

Results: To be presented

Conclusion: To be presented

Learning Objectives:
Describe the correlation between anti-Xa levels and creatinine clearance for patients on treatment doses of enoxaparin.
Discuss the utility of obtaining anti-Xa levels in patients with moderate renal impairment.

Self Assessment Questions:
How are anti-Xa levels and creatinine clearance correlated?
A Increase anti-Xa levels with higher creatinine clearances
B Increase anti-Xa levels with lower creatinine clearances
C There is no correlation between anti-Xa levels and creatinine clearances
D None of the above

In order to evaluate therapeutic anticoagulation in patients with moderate renal impairment:
A Peak anti-Xa levels are drawn 3-5 hours after the first dose of enoxaparin
B Trough anti-Xa levels are drawn 3-5 hours after the dose at steady state
C Peak anti-Xa levels are drawn 3-5 hours after the dose at steady state
D Are never necessary to monitor

Q1 Answer: B  Q2 Answer: C

ACPE Universal Activity Number 121-999-11-269 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
The Surgical Care Improvement Project (SCIP) targets reduction of postoperative infections through implementation of several safety measures. One of these measures, SCIP-INF-4, requires postoperative glucose levels of 200 mg/dL or less at 6:00 am on days 1 and 2 following cardiac surgery. Failure to meet this measure may impact adverse events and decrease hospital reimbursement. The purpose of this study is to compare SCIP-INF-4 failure rates between three intervention groups, examine the impact of measure failure on ICU length of stay, hospital length of stay, and infection rates, as well as assess the impact of postoperative day, day of week, patient care area, and patient demographics on postoperative glycemic control.

Three quality interventions were implemented in three phases over 3.5 years. Phase I included standardized postoperative paper order sets for continuous infusion (CI) insulin therapy and for conversion of CI to subcutaneous (SC) insulin. Phase II included replacement of the CI insulin paper order set with an electronic CPOE tool, while the paper CI to SC insulin order set remained. Phase III replaced the CI to SC insulin paper order set with a CPOE tool, used in conjunction with the electronic tool established in Phase II.

Following Institutional Review Board approval, a retrospective cohort analysis was conducted. Adult patients who underwent cardiac surgery between January 2007 and July 2010 were identified using ICD-9 codes and the medical record. Patients excluded from meeting SCIP-INF-4 as defined by CMS were excluded. Baseline characteristics, primary endpoint, and subgroup analysis were analyzed using chi square and Fishers exact test. A p-value less than 0.05 was considered significant. A stepwise, forward univariate to multivariate logistic regression compared the risk factors for failing the measure using chi-square for categorical variables and Student’s t-test for parametric continuous variables.

Results are forthcoming.

Learning Objectives:
Describe the Surgical Care Improvement Project (SCIP) and requirements for passing SCIP-INF-4.
Discuss variables that may contribute to SCIP-INF-4 failure and how measure failure may impact ICU length of stay, hospital length of stay, and infection rates.

Self Assessment Questions:
Which of the following patient populations is required to pass SCIP-INF-4 by the Centers for Medicare and Medicaid Services (CMS)?
A: Patients with significant burns undergoing cardiac surgery
B: Patients with diabetes undergoing cardiac surgery
C: Patients undergoing a heart transplant procedure
D: Patients undergoing an entirely laparoscopic cardiac procedure

Glycemic control (passing SCIP-INF-4) following cardiac surgery is important because:
A: Failure to meet SCIP-INF-4 increases hospital reimbursement
B: Passing the measure may prolong hospital length of stay
C: Passing the measure may decrease the incidence of sternal wound
D: Failing the measure may decrease ICU length of stay

Q1 Answer: C  Q2 Answer: B

EVALUATION OF THE USE OF ACETYLCHOLINESTERASE INHIBITORS IN A VETERANS AFFAIRS MEDICAL CENTER

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Purpose: There is an increasing public awareness and concern regarding the development and progression of dementia, with projected estimates of 16 million individuals having dementia by 2050. Dementia is a leading cause for nursing home placement and carries significant personal and financial burden for both patients and caregivers. Although no cure is currently available for the disease, there are medications approved to slow the progression of dementia. An evaluation of the effective use of acetylcholinesterase inhibitors at the Huntington VA Medical Center (HVAMC) will aid in the advancement of overall prescribing practices and monitoring of acetylcholinesterase inhibitors used at the medical center.

Methods: This study is a retrospective chart review of patients admitted to the HVAMC with documented prescription filled for galantamine or donepezil. Charts will be reviewed for treatment initiation, titration, duration and the patient outcomes associated with these factors. The primary endpoint will be time to nursing home placement. Secondary endpoints will include time to death and number and frequency of adverse drug effects. Memantine use, age, gender, and a Parkinson's diagnosis will be assessed as confounders.

Results: Data is currently being collected and analyzed. Results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Recall the stages of dementia.
Discuss the current therapies available for the treatment of dementia as they relate to stage of disease.

Self Assessment Questions:
What is the minimum interval of time before galantamine should be titrated?
A: 1 week  
B: 2 weeks  
C: 4 weeks  
D: 6 weeks

At what stage would it be appropriate to consider memantine as an adjunct agent?
A: Mild
B: Moderate
C: Severe
D: Any

Q1 Answer: C  Q2 Answer: B
**Appropriateness of Acute Care Adult Acetaminophen Utilization at a Community Hospital**

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**Background:**  
Acetaminophen is one of the most commonly used medications available to treat pain and fever. It is estimated that 23% of American adults use acetaminophen weekly. However, acetaminophen can put patients at risk of unintentional adverse events. At Parkview Hospital, many patients receive pain medications that contain acetaminophen. Due to the numerous over-the-counter and prescription products with varied routes, frequencies and amounts of acetaminophen in each, patients may receive greater than the recommended daily dose of acetaminophen, 4 grams per 24 hour period.

**Purpose:**  
To evaluate the appropriateness of prescribing and administering acetaminophen containing products at Parkview Hospital.

**Methods:**  
This is a retrospective analysis of randomly selected subjects 18 years of age and older who received at least one product containing acetaminophen between August 1, 2009 and July 31, 2010. Acetaminophen total daily doses are recorded based on a calendar day. Subjects will be stratified into one of six study groups depending from which product the majority of acetaminophen was received. The primary endpoint is to determine the type of acetaminophen containing product that has the most potential to increase the patients risk of receiving greater than the recommended maximum daily dose of acetaminophen. Secondary endpoints include the determination of the specific strengths of individual products which most highly contribute to overall risk and analysis of prescribing habits. Data will be analyzed using descriptive and comparative statistics.

**Results/Conclusions:**  
Data collection is currently ongoing. Results and conclusions will be presented at the Great Lakes Conference.

**Learning Objectives:**  
Discuss the importance of abiding by the current acetaminophen maximum daily dosage recommendation of 4 grams. Recognize the variety of acetaminophen containing products which impede the ability of patients and healthcare providers to avoid exceeding 4 grams per 24 hour period.

**Self Assessment Questions:**  
Which of the following statements is correct?

A. Acetaminophen is considered a dangerous medication and only as  
B. Acetaminophen has been known to cause substantial risk to the patient  
C. Acetaminophen is seldom found in combination with other pain medications  
D. Acetaminophen is dosed the same way in both adult and pediatric medication

Which of the following statements is correct?

A. The majority of acetaminophen overdoses are due to intentional in  
B. The maximum recommended dose of acetaminophen is 3 grams p.o.  
C. The over-the-counter acetaminophen preparations frequently contain more than 3 grams p.o.  
D. Pregnant women should avoid taking acetaminophen as an over-the-counter medicine

Q1 Answer: B  
Q2 Answer: C

**Impact of ADHD on Adherence to Antiretroviral Therapy in Pediatric Patients with HIV**

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**Background:**  
Highly Active Antiretroviral Therapy (HAART) has dramatically improved survival rates for pediatric patients with Human Immunodeficiency Virus (HIV). Non-adherence to therapy is a barrier for many children and adolescents with HIV. Adherence is essential for suppressing viral load, preventing resistance, and improving immune function. Children with Attention Deficit Hyperactivity Disorder (ADHD) may be at higher risk for non-adherence, due to ADHD symptoms of impulsivity and disorganization.

**Statement of Purpose**  
1. To evaluate effect of ADHD on adherence to antiretrovirals in pediatric patients with HIV.  
2. To determine if pharmacists should target this population with education on adherence.

**Statement of Methods**  
This pilot retrospective chart review is in progress at the pediatric and adolescent HIV clinics at CHM and UHC. Inclusion criteria: HIV infected patients 3 to <18 years of age with a clinic visit from January 2009 to July 2010. Exclusion: Pregnancy, no data on viral load and percent/absolute CD4 count, no documentation of antiretrovirals. The study sample consists of two groups of patients: a study group (n=30) with ADHD and a control group (n=30) without ADHD selected from the historical clinic population via physician and psychologist recall. Data collected includes demographics, viral load, percent/absolute CD4 count, ADHD medications, HIV medications, adherence, and missed clinic visits. Descriptive statistical analyses will be performed using SPSS.

**Results**  
Enrollment to date: n=22 (n=14 ADHD/HIV; n=8 HIV control), 13/22 male; average age 12 yrs (range 7.2-16). Daily pill burden ranged from ≤ to 9 pills. 17 patients missed clinic appointments over the 18 month study period, with the highest number of missed appointments (n=8) occurring in 2 subjects with ADHD.

**Conclusions**  
To be presented at Great Lakes Pharmacy Residency Conference

**Learning Objectives:**  
Describe barriers to adherence in pediatric patients with HIV. Recognize the role of pharmacists in improving patient adherence.

**Self Assessment Questions:**  
Which of the following is a barrier to antiretroviral medication adherence in the pediatric population?

A. Many liquid formulations  
B. Palatability of dosage forms  
C. Low pill burden  
D. Minimal side effect profiles

What can pharmacists do to improve patient adherence?

A. Distribute package inserts with each new prescription  
B. Encourage patients to learn to swallow tablets and capsules  
C. Suggest that patients pair medication administration to a routine activity  
D. Remind patients that all medications have side effects which they should be prepared for

Q1 Answer: B  
Q2 Answer: C

**Appropriateness of Acute Care Adult Acetaminophen Utilization at a Community Hospital**

**Impact of ADHD on Adherence to Antiretroviral Therapy in Pediatric Patients with HIV**
PHARMACISTS ASSESSMENT OF DEPRESSION DURING A COMMUNITY-BASED MEDICATION THERAPY MANAGEMENT SESSION USING A DEPRESSION SCREENING TOOL

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Statement of the purpose:
Depression is highly treatable, but widely under-recognized in the community. Community pharmacists are available to offer clinical services and are ideal providers to help detect depression. The purpose of the study is to determine the prevalence of symptoms associated with depression among Medicare Part D patients who qualify for a community pharmacy-based medication therapy management (MTM) session, examine the occurrence of substance abuse with positive screened patients, and identify any disease states or medications that may be a common occurrence in positive screened patients.

Statement of methods used:
Patients included in the study will be eligible for community-based MTM through their Medicare Part D insurance plan. Anyone younger than 65 years old or cash paying patients will not be included in the study. It is estimated that 250 patients will be screened during the study. Research will be collected at SUPERVALU pharmacies across the nation from November 2010 - March 2011. Specially trained pharmacists will obtain consent and administer the patient health questionnaire-9 (PHQ-9) depression screening tool as part of the MTM assessment. Patients will be educated on the results of their depression screening and will be given the appropriate resources, including medication therapy recommendations, educational resources, hotline information and physician or emergency department referral. All documentation from the MTM session will be received and collected for data input through a secure fax line. Gender, age, ethnicity, income, and educational background will be analyzed along with the positive depression screening tool score.

Summary of (preliminary) results to support conclusion:
This study is currently in progress. Multinomial logistic regression and Chi-square will be used to evaluate the data.

Conclusions pending data collection.

Learning Objectives:
Discuss lack of detection and assessment of depression in the community setting.
List five most common types of depression.

Self Assessment Questions:
Which one of the following statements is correct?
A 50% of the population suffers from depression
B 20% of patients are controlled on medications once they are diagnosed
C 70% of depression cases go undetected by physicians
D 80% of patients who receive prescriptions for depression medication

Which one of the following is a type of depression?
A Bipolar disorder
B Seasonal affective disorder
C Schizophrenia
D Premenstrual syndrome

Q1 Answer: C  Q2 Answer: B

ACPE Universal Activity Number 121-999-11-096 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5

SECONDARY LIPID GOAL ATTAINMENT IN VA PATIENTS WITH DIABETES

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The National Cholesterol Education Program Adult Treatment Panel III (NCEP ATP III) recommends patients with diabetes mellitus (DM) focus on a primary lipid goal of low density lipoprotein cholesterol (LDL-C) less than 100 mg/dL and then targeting non-high density lipoprotein cholesterol (non-HDL-C) to a goal of less than 130 mg/dL when triglycerides (TG) are between 200-500 mg/dL. Recent studies suggest non-HDL-C is a reliable marker for coronary heart disease (CHD) in patients with DM and elevated TG. However, studies reporting compliance with the NCEP ATP III secondary non-HDL-C goal are limited in number. This study aims to report NCEP ATP III secondary goal attainment in Veteran Affairs Ann Arbor Healthcare System (VAAAHS) patients with DM, LDL-C less than 100 mg/dL and TG between 200-500 mg/dL. As a secondary aim, prescribing trends for combination lipid therapies will be analyzed for associations with non-HDL-C goal attainment.

This is a retrospective chart review of VAAAHS patients on statin therapy for greater than 6 months with DM, LDL-C less than 100 mg/dL and TG between 200-500 mg/dL without a history of CHD. Subjects were separated based on whether they had a non-HDL-C less than 130 mg/dL upon enrollment. Those with non-HDL-C greater than 130 mg/dL were divided into subcategories based on documented lipid plans for each subject and followed for two years or until 2 or more consecutive non-HDL-C less than 130 mg/dL were achieved. A standardized data collection form was used to gather the following for each subject: demographics, relevant cardiac history, medications, intolerances/adherence with lipid medication(s), lipid results, exercise/diet changes documented. All data was collected using the computerized patient record system.

Based on the inclusion and exclusion criteria, a preliminary report of all patients with DM receiving primary care from VAAAHS between 7/1/07-6/30/08 generated 192 subjects.

Conclusions pending data collection.

Learning Objectives:
Review current lipid management guidelines for patients with DM.
Discuss the rationale for using primary and secondary lipid targets in patients with DM.

Self Assessment Questions:
Patients with diabetes mellitus (DM):
A Often have elevated TG
B Often do not have dyslipidemias
C Often do not have elevated triglycerides
D Are often not on lipid therapy

Calculated non-HDL-C values:
A Represent all potentially atherogenic lipoproteins, including LDL-C
B Do not provide additional benefits over calculated LDL-C values
C Are difficult to obtain
D Are labor intensive

Q1 Answer: A  Q2 Answer: A

ACPE Universal Activity Number 121-999-11-127 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
ASSOCIATION OF HYPERGLYCEMIA WITH CLINICAL OUTCOMES IN HOSPITALIZED PATIENTS RECEIVING ENTERAL NUTRITION

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Purpose:
Hyperglycemia is known to be associated with increased risk of mortality and morbidity (e.g., infection, renal failure, cardiac events) for patients receiving total parenteral nutrition. Patients receiving enteral nutrition are also at risk for hyperglycemia, though there are no studies directly assessing the impact of hyperglycemia on clinical outcomes. The purpose of this study is to determine if there is a significant association between hyperglycemia and outcomes among hospitalized patients receiving enteral nutrition and the glycemic threshold at which blood glucose control becomes significant.

Methods:
A retrospective study of patients admitted to St. John's Hospital (Springfield, IL) from January 1, 2010 to September 30, 2010 and receiving enteral nutrition will be conducted. Data will be obtained by chart review. Age, gender, weight, diagnosis of diabetes mellitus, capillary blood glucose measurements, duration of enteral nutrition, mode of hyperglycemia management, length of stay in the hospital and intensive care unit (ICU), clinical complications (infection, acute renal failure, cardiac complications, respiratory failure requiring mechanical ventilation), and disposition will be recorded for all patients. Subjects will be excluded if systemic corticosteroids have been administered or no capillary blood glucose measurements have been recorded.

Primary study endpoint is a composite of mortality and any clinical complication. Secondary endpoints include frequency of each individual clinical complication, days on mechanical ventilation, intensive care unit length of stay, and hospital length of stay.

Results/Conclusions:
To be presented at Great Lakes Pharmacy Residency Conference

Learning Objectives:
- Explain the known clinical complications relating to hyperglycemia in patients receiving artificial nutrition.
- Identify confounding factors that may affect inpatient glycemic control.

Self Assessment Questions:
Which of the following is a known clinical complication relating to hyperglycemia in patients receiving artificial nutrition?
A. Hypertension
B. Acute renal failure
C. Heart failure
D. Cancer

Which of the following medications is known to significantly increase blood glucose?
A. Lisinopril
B. Aspirin
C. Dexamethasone
D. Simvastatin

Q1 Answer: B   Q2 Answer: C

ACPE Universal Activity Number  121-999-11-288-L01-P
Activity Type: Knowledge-based   Contact Hours: 0.5

EVALUATION OF COST AND CLINICAL OUTCOMES ASSOCIATED WITH PROVIDER EDUCATION AND IMPLEMENTATION OF CLINICAL PRACTICE GUIDELINES FOR THE MANAGEMENT OF COMMUNITY ACQUIRED COMPLICATED INTRA-ABDOMINAL INFECTION

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Purpose
Community acquired complicated intra-abdominal infection (cIAI) are common in clinical practice and account for significant morbidity and mortality. Implementation of research based clinical guidelines for the management of cIAI is crucial for improving patient outcomes. The Infectious Disease Society of America released updated guidelines for the selection of antibiotics for treatment of cIAI in January 2010, which were adopted as internal best practice guidelines by the Gundersen Lutheran Medical Center infectious disease department on April 12th 2010. The objective of this study is to determine the difference in clinical outcomes and antibiotic cost between patients treated for cIAI prior to and after the implementation of the institutional clinical practice guidelines.

Methods
This project was conducted as a retrospective cohort review of patients diagnosed with cIAI and treated as inpatients at Gundersen Lutheran Medical Center between August of 2009 and August 2010. Infections defined as cIAI in the study include peritonitis, cholecystitis, appendicitis and infections due to spontaneous gastrointestinal perforations. ICD9 codes were used to search for potential records within the hospitals electronic medical record system. Records generated were screened for patients meeting the following inclusion criteria: age 18 years or older diagnosed with cIAI within the study period. Excluded from the study were patients with cIAI requiring admission to the intensive care unit at any point during their admission and those with hospital acquired intra-abdominal infections. The following data was collected and analyzed: age, sex, diagnosis, organism(s) isolated in cultures, antibiotics received, duration of antibiotic therapy, antibiotic allergies, antibiotic acquisition costs, surgical interventions performed, need for readmission to the hospital within 30 days of discharge due to unresolved cIAI, and death due to cIAI.

Results and Conclusions
Data collection is ongoing, results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
- Define appropriate antimicrobial therapy for community acquired complicated intra-abdominal infection.
- Identify organisms implicated in community acquired complicated intra-abdominal infection.

Self Assessment Questions:
Which of the following agents is appropriate for empiric management of community acquired complicated intra-abdominal infection?
A. Vancomycin
B. Ciprofloxacin pluc metronidazole
C. Ampicillin-sulbactam
D. Clindamycin

Which of the following pathogens is commonly implicated in community acquired complicated intra-abdominal infection?
A. Enterococcus faecium
B. Candida species
C. Escherichia coli
D. Staphylococcus aureus

Q1 Answer: B   Q2 Answer: C

ACPE Universal Activity Number  121-999-11-210-L01-P
Activity Type: Knowledge-based   Contact Hours: 0.5
OUTCOMES OF A PHARMACY RESIDENT-RUN TOBACCO
CESSATION CLINIC IN A VETERAN POPULATION
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Purpose:
Approximately 27% of veterans surveyed nationally from 2003-2007 are smokers and about 30% of the veterans at the Veterans Affairs Ann Arbor Healthcare System (VAAAHS) are smokers. It is widely known that smoking has negative health consequences. There are multiple programs available to assist patients with smoking cessation, but research has yet to define a gold standard approach to smoking cessation and relapse prevention. It has been shown that pharmacologic therapy in combination with group counseling has the best outcomes.

A tobacco cessation clinic consisting of group counseling along with pharmacologic therapy was started at VAAAHS over one year ago. Since the initiation of the clinic, the impact of the clinic on tobacco cessation outcomes has not been thoroughly assessed. The results of this study will be used to identify future opportunities to maximize smoking cessation rates of veterans attending the clinic.

Methods:
A pharmacy practice resident was the primary investigator (PI) of this descriptive, retrospective study and acted under the supervision of two VAAAHS clinical pharmacists. This study described the outcomes of the pharmacy resident-run tobacco cessation clinic from August 3, 2009 to December 31, 2010.

The PI was responsible for all data collection. Veterans who attended the VAAAHS tobacco cessation clinic at least once from August 3, 2009 to December 31, 2010 were eligible for inclusion in the study. Computerized patient records and clinic intake forms served as the primary source of continuous data. Veterans included in this study were assessed for smoking status (smoke-free or not smoke-free; length of the smoke-free interval), pharmacologic therapies used to achieve smoke-free status (if any), and if the veteran received travel pay to attend the clinic.

Results:
To be presented at the Great Lakes Pharmacy Resident Conference.

Conclusions:
To be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
List three areas for intervention a pharmacist may make in an urban HIV clinic.

Self Assessment Questions:
According to the Treating Tobacco Use and Dependence Clinical Practice Guideline: 2008 Update, which of the following is true?

A: The number of tobacco cessation clinic sessions attended is positive
B: The number of tobacco cessation clinic sessions attended is negative
C: The number of tobacco cessation clinic sessions attended is not correct
D: The session length of tobacco cessation interventions is negative

According to the Treating Tobacco Use and Dependence Clinical Practice Guideline: 2008 Update, the recommendation regarding combining counseling and medication is:

A: For smoking cessation, the combination of counseling and medication is effective
B: Counseling is more effective than medication use for smoking cessation
C: Medication use is more effective than counseling for smoking cessation
D: The combination of counseling and medication use are not effective

Q1 Answer: A  Q2 Answer: A

EFFECT OF AN HIV PHARMACIST ON TREATMENT OUTCOMES IN AN URBAN HIV CLINIC
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PURPOSE: Mean community viral load (CVL) is the average of the most recent viral load of all HIV-infected persons in a defined population and may be an important surrogate marker for patient outcomes. HIV pharmacists can play a pivotal role in outpatient clinic settings through selection of antiretroviral regimens, patient education, adherence counseling, reduction in medication errors and identification of drug-drug and drug-food interactions. The purpose of this study is to examine the effect of an HIV pharmacist on the mean CVL of an urban HIV clinic.

METHODS: This retrospective observational study included patients 18 years of age or older who were active patients at the LifeCare clinic in Indianapolis, IN. The primary outcome was the mean change in CVL from baseline at 12 months after the arrival of the HIV pharmacist. Secondary outcomes include mean change in CD4+ count at 6 and 12 months, and mean change in number of hospital admissions, number of emergency department visits, and number of new opportunistic infection diagnoses during the defined study period.

RESULTS AND CONCLUSIONS: Data collection is in progress and will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
List three areas for intervention a pharmacist may make in an urban HIV clinic.

Self Assessment Questions:
All of the following are interventions a pharmacist in an urban HIV clinic can make, except:

A: provide adherence counseling
B: identify drug-drug interactions
C: evaluate antiretroviral regimens
D: diagnose new health conditions

A lowered CVL has what impact on a defined population?

A: improved overall health
B: worsened overall health
C: no effect on overall health
D: not enough evidence exists to support A or B

Q1 Answer: D  Q2 Answer: A

ACPE Universal Activity Number 121-999-11-356-L02-P
Activity Type: Knowledge-based  Contact Hours: 0.5
WEIGHT-BASED HEPARIN DOSING IN OBESE PATIENTS
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Introduction
The increasing trend of obesity in the United States has posed challenges to dosing many medications including intravenous (IV) heparin. A weight-based approach is recommended for the dosing of IV heparin, but the application of such an approach in obese patients remains unclear. The protocol employed at our institution limits, or “caps,” the heparin dose for patients weighing in excess of 100 kilograms (kg). The objective of this study is to determine whether dose capping of heparin delays time to therapeutic activated partial thromboplastin time (aPTT) in patients weighing greater than 100 kg.

Methods
Pharmacy records were used to identify and retrospectively collect data from those patients managed according to the weight-based pharmacy-driven heparin protocol from March to November 2010. Patients with a duration of IV heparin therapy less than 24 hours were excluded.

Results
Time to therapeutic aPTT showed an increasing trend in patients weighing ≥100 kg with an average time of 30.8 hours versus 24 hours for those weighing <100 kg. Of the 94 patients evaluated, 4 patients in the <100 kg group and 8 patients in the ≥100 kg group never attained therapeutic aPTT values. Equal numbers of patients in both the <100 kg and the ≥100 kg groups had aPTT values that remained subtherapeutic throughout the duration of therapy. Conversely, two morbidly obese patients had initial aPTT values >140 seconds which remained supratherapeutic throughout the duration of therapy. Statistical analysis is currently being conducted.

Conclusion
Though an optimal dosing strategy for IV heparin in obese patients has not yet been elucidated, the data reveal that dose capping may hinder achievement of therapeutic aPTT in some patient populations while serving as a significant safety mechanism in others. The results of this study provide us with assurance that the current weight-based pharmacy-driven heparin protocol warrants revision.

Learning Objectives:
Describe various approaches to defining obesity that have been observed in the heparin literature. Explain the concept of dose capping with respect to the volume of distribution of heparin.

Self Assessment Questions:
Which of the following approaches to dosing intravenous heparin has been widely supported by the literature?
A. Weight-based dose based on ideal body weight
B. Weight-based dose based on ideal body weight plus 25%
C. Weight-based dose based on actual body weight
D. BMI-based approach

Which pharmacokinetic property of heparin supports the concept of using a modified weight-based approach for dosing heparin in obese patients?
A. Volume of distribution that approximates that of blood volume
B. Protein binding to LDL, globulins, and fibrinogen
C. Metabolism by N-desulfation
D. The limited role of the kidney in elimination

Q1 Answer: C  Q2 Answer: D

AMBULATORY CARE PHARMACISTS IMPACT ON PATIENTS WITH DIABETES
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Purpose: 1) To evaluate clinical outcomes and changes in disease control markers in patients with diabetes seen by ambulatory care pharmacists; 2) To assess the components of patient care provided by pharmacists and patient factors that may affect outcomes; 3) To identify specific interventions by pharmacists that have the greatest impact on patient outcomes; 4) To utilize study results to make recommendations for improving future patient care.

Methods: Retrospective chart review of patients seen by ambulatory care pharmacists for diabetes management. Data collection includes: Hemoglobin A1c (HbA1c) and blood pressure (BP), and other patient outcomes and on the interventions and continuity of care provided by these pharmacists. Data is collected from the patients electronic health records and analyzed utilizing Microsoft Excel and Sigma Plot.

Results: Of the 35 patients, whose data has been collected and analyzed thus far, 21 are female and 26 have been identified as African American. Their average age is 51.3 years and BMI is 36.2%. Average HbA1c at baseline, three months, and six months is 9.88, 7.99, and 8.76 respectively (n = 24, 28, and 17). Average systolic blood pressure at baseline is 126.3 mmHg and at 3 months is 128.8 mmHg (n = 34).

Conclusions: This study has been limited by the availability of data collected through chart review, for many patients baseline or follow-up data at specified 3 month intervals has not been present. This finding and changes in disease state markers observed thus far are evidence that many patients have barriers to receiving and complying with care. Barriers identified include transportation to appointments and lack of understanding the importance of monitoring their blood glucose consistently as directed. From study results, the pharmacotherapy clinic will work to implement strategies to overcome barriers and focus on strongest interventions to improve outcomes.

Learning Objectives:
Describe three assessments or interventions that can be made by ambulatory care pharmacist to improve outcomes in patients with diabetes.
Discuss how ambulatory care pharmacists may be able to overcome two of the barriers preventing patients from having positive outcomes.

Self Assessment Questions:
Of the assessments and interventions by ambulatory care pharmacists on which study data was collected, which was found to be the least prevalent?
A. Assessment of blood glucose log and insulin titration
B. Review of hypoglycemia symptoms and treatment
C. Assessment and recommendations on vaccination status
D. Ordering laboratory monitoring for medication therapies

Of the following patient factors that affect compliance, which one may ambulatory care pharmacists be able to improve through clinic visits?
A. Finances available for purchasing food and medications
B. Insurance coverage of medications and diabetes testing supplies
C. Access to transportation to office visits and pharmacy to obtain medications
D. Understanding of their disease state, management strategies, and self-management practices

Q1 Answer: B  Q2 Answer: A

ACPE Universal Activity Number: 121-999-11-113 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
Purpose: Phytanodione, commonly known as vitamin K, is an essential factor for the coagulation cascade. Vitamin K is commercially available as an emulsion injection and oral formulation. The most common indication for prescribing vitamin K is reversal of a supratherapeutic international normalized ratio (INR) due to excessive anticoagulation with warfarin. The CHEST guidelines provide recommendations for the management of a supratherapeutic INR regardless of bleeding. Recommendations include, but are not limited to, omitting a warfarin dose and/or administering vitamin K. Currently there is no literature describing the impact of inappropriate vitamin K use on hospital length of stay (LOS).

Methods: This retrospective chart review evaluated adult patients admitted to Methodist Hospital in Indianapolis, IN between July 1, 2008 and October 31, 2010. Patients were included if the following criteria was met: at least 18 years of age and received therapy for reversal of a supratherapeutic INR according to the CHEST guidelines. Therapy for reversal of a supratherapeutic INR was defined as discontinuation of warfarin or administration of vitamin K. Patients were excluded with a diagnosis of a coagulopathy unrelated to warfarin use, or if warfarin was not re-initiated during hospitalization. The primary objective is to determine if the inappropriate use of vitamin K for the reversal of supratherapeutic INR prolongs LOS. Secondary objectives include the assessment of adherence to the CHEST guidelines for vitamin K prescribing, and to evaluate the time to achieve a therapeutic INR when re-initiating warfarin.

Results and Conclusion: Preliminary results were presented at the 2011 Great Lakes Pharmacy Resident Conference. Data collection is still in process, and final results will be presented in April.

Learning Objectives:
Recall the 2008 CHEST recommendations for the management of supratherapeutic INRs in patients receiving warfarin.
Identify appropriate routes of vitamin K administration.

Self Assessment Questions:
All of the following are recommended by the CHEST 2008 guidelines for an INR of 5.9 with no significant bleeding present EXCEPT:
A: Omit next 1-2 doses of warfarin, monitor frequently, resume at low
B: Omit next dose of warfarin and give vitamin K 1-2.5 mg by mouth if
C: Hold warfarin and give vitamin K 5 mg intravenously
D: Vitamin K 5 mg by mouth if patient requires urgent surgery

Which of the following statements is correct?
A: The preferred route of vitamin K is intravenous.
B: The preferred route of vitamin K is oral.
C: The preferred route of vitamin K is subcutaneous.
D: The preferred route of vitamin K is intramuscular.

Q1 Answer: C  Q2 Answer: B

ACPE Universal Activity Number 121-999-11-312-L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5

Impact of Pharmacist-Lead Medication Therapy Management Sessions on Readmission Rates for Recently Discharged Internal Medicine Patients
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Purpose
The purpose of this study is to analyze three different interventions made by the pharmacist during the patient discharge and follow-up processes to determine if readmission rates can be decreased. Additionally, this study will help determine the feasibility of having a pharmacist perform medication therapy management sessions in conjunction with a patient post-hospital discharge follow-up visit.

Methods
This study has been approved by the Luther Midelfort Institutional Review Board. Inpatient pharmacist education regarding new recommendations from the United States Pharmacopeia on patient friendly labeling practices was reviewed. This information was presented verbally and as an online training module to inpatient pharmacists and reviewed the proper format for entering patient friendly instructions in the electronic medical record for patient friendly discharge instructions.

Additionally, the questionnaire currently used for a two-day follow-up phone call was modified to include questions to ascertain adherence or other medication issues the patient might experience after discharge. Patients were encouraged during this phone call to bring all medications to their follow-up appointment. Lastly, medication therapy management visits were conducted in conjunction with physician five-day follow-up visits and last approximately 20 minutes. Data was collected between January 2011 and March 2011. Recommendations and concerns were documented for the physician to address during the follow-up appointment and a medication therapy management note was entered into the electronic charting system as part of the patient record. These patients were then tracked for 30 days to analyze readmission rates.

Preliminary Results
At present time there is not enough data to draw preliminary results.

Conclusions Reached
Results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference and in the final manuscript.

Learning Objectives:
Describe current recommendations from the United States Pharmacopeia on patient friendly labeling practices.
Identify what types of assessment questions are best for identifying medication problems experienced by patients after discharge.

Self Assessment Questions:
Which of the following is a suggestion from the United States Pharmacopeia for making patient labels more patient-friendly?
A: Use many different ink colors to highlight important information
B: Use numeric characters instead of alphabetic characters to express
C: Use “as directed” when instructions are unclear
D: Avoid white space on the label to ensure all information is provided

Which of the following is an additional problem that adding pharmacy-targeted questions to a follow-up phone call might identify?
A: Lack of a regular outpatient pharmacy for all medications
B: Refusal of a patient to weigh themselves daily
C: Transportation conflict for a follow-up appointment
D: Appointments for different prescribers at the same time

Q1 Answer: B  Q2 Answer: A

ACPE Universal Activity Number 121-999-11-211-L04-P
Activity Type: Knowledge-based  Contact Hours: 0.5
OPTIMIZING UTILIZATION OF CLINICAL SURVEILLANCE SOFTWARE BY PROVIDING DETAILED EDUCATION AND TOOLS TO CLINICAL PHARMACISTS FOR SUCCESSFUL COMPLETION OF TARGETED INTERVENTIONS

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Purpose:
Ministry Saint Josephs Hospital (MSJH) implemented pharmacy clinical surveillance and documentation programs to enhance pharmacists' ability to identify and act on targeted interventions. The targeted interventions focus on patient safety, appropriate drug utilization and cost-containment initiatives. The primary objective is to determine the impact of detailed education of pharmacists on optimizing effective use of clinical surveillance and documentation programs. Secondary objectives are to assess the sustainability of the education on documented rate of targeted interventions and associated cost avoidance.

Methods:
Education on targeted interventions within the clinical surveillance software was presented to pharmacists. A survey was used to assess pharmacist educational preferences and tools and resources required. Baseline pharmacist intervention data was collected from October 4 - 24 2010. Targeted interventions included intravenous to oral (IV to PO) conversion, antimicrobial stewardship and appropriate use of high-cost medications. Education was provided during week one, followed by collection of documentation of the targeted intervention for the following three weeks - this was repeated for each targeted intervention. The final educational session will summarize all three interventions. Documentation of targeted interventions will be collected for three weeks to analyze sustainability. Cost avoidance will be determined using software generated information.

Preliminary Results:
A survey taken by 19 pharmacists showed the preferred method of education was email and preferred tool was hand-outs/pocket cards. Baseline data revealed 2.5% of total documented interventions were IV to PO. Three weeks post education, 15.8% of total documented interventions were IV to PO. A total of 106 IV to PO evaluations were documented from November 1 - 24, 2010. Of the 106 evaluations, 79 were appropriate for IV to PO conversion. Physicians accepted 85% of the interventions.

Results/Conclusion:
Analysis of results is ongoing. Results and conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:
Describe when IV to PO conversion of a medication is appropriate. List key interventions that are included in antimicrobial stewardship.

Self Assessment Questions:
What is an inclusion criterion for IV to PO conversion of a medication?
A Patient is NPO
B Patient has an active GI bleed
C Patient is receiving other oral medication
D Patient is on NG tube with continuous suction

What intervention should be included as part of an antimicrobial stewardship program?
A IV to PO conversion
B De-escalation of antibiotics once culture results are known
C Appropriate antibiotic based on culture results
D All of the above

Q1 Answer: C  Q2 Answer: D

RETROSPECTIVE EVALUATION OF CLINICAL DECISION SUPPORT IMPLEMENTATION FOR APPROPRIATE GERIATRIC DOSE SELECTION IN HOSPITALIZED PATIENTS

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Purpose:
Inappropriate prescribing of medication in the elderly is a major cause of medication-related adverse drug events (ADEs) and is associated with an increased risk of morbidity and mortality. Consequently, appropriate medication use in the elderly is outlined as a national quality measure. An effective intervention that has been utilized to reduce inappropriate prescribing is the implementation of computerized physician order entry (CPOE) with the provision of clinical decision support (CDS) in the electronic health record (EHR). CDS has shown to improve physician prescribing practices and reduce ADEs such as in-hospital fall rates in the elderly. The objective of this study is to establish, implement and evaluate CDS at the point of order entry to help guide prescribers to select geriatric dosing recommendations for the following medications: cyclobenzaprine, diazepam, diphendphydramine, ketorolac, and merperidine.

Methods:
A retrospective chart review will be performed for elderly patients, 65 years and older, hospitalized within the NorthShore University HealthSystem who were prescribed at least one of the selected medications during pre-CDS and post-CDS implementation periods. The analysis will include comparison of dosing recommendations for the selected medications during pre-CDS and post-CDS implementation periods. The primary outcome measure is to evaluate the number of prescribed medication orders that are compliant with the dosing recommendations for the two implementation periods. This will provide insight regarding the potential impact of CDS in the EHR at this institution and the future development of this tool to optimize dosing in the elderly.

Analysis of results is ongoing. Results and conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:
Describe the importance of appropriate dose selection for the elderly population to reduce medication related ADEs and decrease patients risk of morbidity and mortality. Explain the impact that computerized physician order entry with the provision of clinical decision support has in reducing inappropriate prescribing.

Self Assessment Questions:
Elderly patients are at an increased risk for adverse drug events because of which of the following physiological changes?
A Increased body mass
B Increased hepatic function
C Increased renal clearance
D Altered receptor sensitivity

Which of the following has resulted from the implementation of CPOE with CDS for dose recommendations?
A Increase in-hospital fall rates
B Increase in the number of prescriptions of recommended daily dosages
C Increase the standard deviation of drug doses
D Changes did not persist at 1- and 2-year follow up

Q1 Answer: D  Q2 Answer: B

ACPE Universal Activity Number 121-999-11-473 -L05-P

Activity Type: Knowledge-based Contact Hours: 0.5
DEVELOPMENT, IMPLEMENTATION, AND ASSESSMENT OF AN EMERGENCY DEPARTMENT-BASED IMMUNIZATION SCREENING AND ADMINISTRATION PROTOCOL

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Purpose: Recently, cases of pertussis have been increasing, both nationally and locally. This study will assess the effect of screening emergency department patients for Td/Tdap vaccination status on vaccination rates. It will be used to determine the feasibility of implementing a screening program into clinical practice in an emergency department.

Methods: This prospective cohort study will include patients with an emergency severity index (ESI) acuity 3-5 seen in the Methodist Hospital Emergency Medicine and Trauma Center (EMTC). Patients will be screened for Td/Tdap vaccination using a screening tool based on CDC inclusion/exclusion criteria and offered an appropriate vaccination (Td or Tdap). Patients with an ESI acuity of I or II or who are inpatients, pregnant, or less than 18 years old will be excluded. The rate of vaccination with Td/Tdap after implementation of the screening tool will be compared to the rate prior to implementation using chi-square analysis. In addition, the proportion of patients receiving the appropriate vaccine based on CDC criteria and vaccination history will be assessed.

Results/Conclusions: Pending IRB Approval

Learning Objectives:
Describe the need for increased immunization against vaccine-preventable diseases.

Self Assessment Questions:
Cases of ________ have been increasing in recent years, bringing a need for increased immunization of the community.
A: Tetanus
B: Diphtheria
C: Pertussis
D: Measles

As described, the study and protocol will screen which of the following patients for immunization?
A: A pregnant woman who has received the initial tetanus series, but
B: A 17 year-old who is up to date on all immunizations
C: A patient presenting after an MVC (ESI acuity 1)
D: A 25 year-old female presenting with UTI symptoms triaged with E

Q1 Answer: C  Q2 Answer: D

ACPE Universal Activity Number 121-999-11-052 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5

AN EVALUATION OF PATIENT OUTCOMES ASSOCIATED WITH PSEUDOMONAS AERUGINOSA INFECTIONS AFTER IMPLEMENTATION OF A NEW PIPERACILLIN/TAZOBACTAM DOSSING STRATEGY

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Background:
Pseudomonas aeruginosa (PSA) is the most common isolated pathogen in hospitalized patients with 30-day mortality rates ranging from 28% to 43%. Piperacillin/tazobactam, an antibiotic that exhibits time-dependent bactericidal activity, is a common agent used against PSA. In March 2010, our institution implemented a protocol that allowed for the automatic conversion of 30-minute piperacillin/tazobactam infusions to be dosed as an extended infusion over 4 hours.

Purpose:
The purpose of this study was to evaluate the clinical/microbiological outcomes pre- and post-implementation of the protocol as well as evaluate the cost savings to our institution.

Methods:
This observational, retrospective, cohort study was conducted in patients who had confirmed PSA infections isolated from blood, sputum, and wound cultures and who also received piperacillin/tazobactam during the months of May 2009 through December 2010. Two groups (50 patients pre- and post-implementation of the protocol) who met the inclusion/exclusion criteria were compared. Inclusion criteria included: age ≥ 18 years, confirmed susceptible PSA infection, piperacillin/tazobactam given for ≥ 48 hours and administered within 72 hours of documented infection, and absolute neutrophil count ≥ 1000. Exclusion criteria included: greater than 1 day of intermittent piperacillin/tazobactam infusion before conversion to extended infusion, patients who received another anti-psudomonal beta-lactam antibiotic within 5 days prior or during treatment, and patients with bone marrow transplants or cystic fibrosis. Clinical/microbiologic outcomes included 14 day mortality and length of stay in the hospital after positive culture results, days until normalization of white blood cell count and resolution of fever, and the eradication of PSA from culture results or patient improvement without subsequent cultures for re-assessment. The cost savings outcome was determined by the dollars spent on piperacillin/tazobactam for patients meeting the inclusion criteria.

Results/Conclusions:
Data collection and analysis are ongoing; results will be presented at the Great Lakes Pharmacy Conference.

Learning Objectives:
Describe the pharmacodynamic profile of piperacillin/tazobactam that allows this antibiotic to be dosed as an extended infusion.
Discuss the potential advantages and disadvantages of dosing piperacillin/tazobactam as an extended infusion.

Self Assessment Questions:
The microbiological response of piperacillin/tazobactam is maintained when the drug concentration remains above the minimum inhibitory concentration (MIC) for ________ of the dosing interval.
A: 10-20%
B: 20-40%
C: 40-60%
D: 80-100%

What pharmacodynamic parameter best describes the bactericidal activity of piperacillin/tazobactam?
A: Cmax / MIC
B: MIC / Cmax
C: T > MIC
D: MIC > T

Q1 Answer: C  Q2 Answer: C

ACPE Universal Activity Number 121-999-11-271 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
Pharmacy Resident Conference.

RESULTS AND CONCLUSION: To be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Identify barriers in the preparation, delivery, and administration of STAT antibiotics, and discuss how these barriers can impact patient safety.

Self Assessment Questions:
Which of the following can significantly delay in initiation of STAT antibiotics yet can compromise patient safety?
- A: Increased patient residence
- B: Hand delivery of products
- C: Improved physician to pharmacy communication
- D: CPOE

Recently published data shows early initiation of intravenous antibiotics in children with which disease process correlates to shorter durations of mechanical ventilation and hospital length of stay?
- A: Hospital-acquired pneumonia
- B: Meningitis
- C: Community-acquired pneumonia
- D: Osteomyelitis

Q1 Answer: A Q2 Answer: C

IMPACT OF BODY WEIGHT ON POTASSIUM REPLACEMENT THERAPY IN CRITICALLY ILL PATIENTS
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Purpose:
Hypokalemia is a common electrolyte abnormality in critically ill patients. Common causes of hypokalemia include diarrhea, alkalosis, and diuretic therapy. Despite the fact that hypokalemia is a common condition, that frequently develops in critically ill patients, few studies have evaluated its management. Identification of the extent of body weight effect may lead to improved potassium replacement dosing. The purpose of this study is to evaluate the correlation between body weight and increase in serum potassium concentrations following potassium replacement in critically ill patients.

Methods:
This is a retrospective cohort study of adult (≥ 18 years of age) patients from the medical and surgical intensive care units who received potassium replacement therapy between May 15 to November 15, 2010. Exclusion criteria include concurrent renal replacement therapy, parenteral nutrition, continuous diuretic infusions, renal insufficiency, pH ≤ 7.3 or ≥ 7.5, pregnancy, and baseline serum potassium > 4mEq/L. The following data will be collected: demographics (age, height, weight, unit and gender), serum potassium concentrations, variables surrounding potassium usage (dose, route, date and time administered), use of medications that affect potassium (angiotensin converting enzyme inhibitors, angiotensin receptor blockers, diuretics, insulin and steroids), serum creatinine, serum magnesium concentrations, and blood pH.

Results/Conclusions:
In Progress

Learning Objectives:
Review common causes of hypokalemia.
Discuss current treatment strategies of hypokalemia in critically ill patients.

Self Assessment Questions:
Common causes of hypokalemia include?
- A: Translocation of potassium into intracellular compartment
- B: Increased losses of potassium
- C: Eating foods containing high amounts of potassium
- D: A & B

Dosing of potassium replacement therapy is largely empirical and individualized based on what patient specific factors?
- A: Serum potassium concentration
- B: Renal function
- C: Medications
- D: All of the above

Q1 Answer: D Q2 Answer: D

ACPE Universal Activity Number 121-999-11-385 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5

EVALUATION OF TIME TO ANTIBIOTICS IN PEDIATRIC PATIENTS: A QUALITY IMPROVEMENT STRATEGY
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PURPOSE: Identify barriers to STAT antibiotic administration and apply targeted interventions to improve the time to first dose intravenous antibiotics in pediatric patients who present with febrile events at Peyton Manning Childrens Hospital at St. Vincent. Recently published pediatric literature correlates longer time from initial presentation to initiation of parenteral antibiotic therapy to longer length of hospital stay and longer duration of mechanical ventilation in the setting of bacterial community-acquired pneumonia.

METHODS: Pre-intervention data of time to first dose of antibiotics from the first quarter 2010 was gathered by retrospective review. Detailed flow charts were created to identify barriers to timely antibiotic administration. Barriers identified through the flow charts formed the basis for interventions to improve the times from physician order to antibiotic administration. Data points collected included patient demographics, diagnosis, date and time physician order written, faxed to pharmacy and time of antibiotic administration. The intervention includes education on updated policies for pediatric hospitalists (PHS) and pediatric hematology/oncology (PHO) physicians, pediatric nurses, pharmacists, and pharmacy technicians. Education consists of 5-10 minute presentations reviewing the importance of timely antibiotic administration and explaining procedural updates made to pharmacy data entry and dispensing to support first dose intravenous antibiotics. The revised pharmacy procedure involves treating all STAT first dose intravenous antibiotics as highest priority. Additional communication between physicians and pharmacists by way of a telephone call and use of brightly colored signage to alert nurses to antibiotic arrival will be used to expedite intravenous antibiotic administration. Post-intervention data points will be consistent with those previously collected and will be gathered by retrospective review for comparison.

RESULTS AND CONCLUSION: To be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Identify barriers in the preparation, delivery, and administration of STAT intravenous antibiotics.
Discuss recently published data evaluating the timing of antibiotics and clinical outcomes in children with bacterial community-acquired pneumonia.

Self Assessment Questions:
Which of the following can significantly decrease delay in initiation of STAT antibiotics yet can compromise patient safety?
- A: Automated dispensing cabinets
- B: Hand delivery of products
- C: Improved physician to pharmacy communication
- D: CPOE

Recently published data shows early initiation of intravenous antibiotics in children with which disease process correlates to shorter durations of mechanical ventilation and hospital length of stay?
- A: Hospital-acquired pneumonia
- B: Meningitis
- C: Community-acquired pneumonia
- D: Osteomyelitis

Q1 Answer: A Q2 Answer: C
ACPE Universal Activity Number 121-999-11-072 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

Activity Type: Knowledge-based Contact Hours: 0.5
IMPLEMENTATION AND EVALUATION OF A PHARMACIST-DIRECTED BLOOD PRESSURE PROGRAM IN A MANAGED CARE SETTING

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Purpose:
The primary purpose of this study is to determine if a pharmacist-driven, targeted intervention utilizing home blood pressure readings can improve the proportion of patients who achieve their blood pressure goal.

Methods:
An education session on blood pressure and blood pressure monitoring will be developed and offered to patients with uncontrolled hypertension. A convenience sample of 50 patients who meet study criteria will be invited to participate in the study. Identified patients will be invited to make appointments with the pharmacy resident to receive a one-time education session. Patients will be provided with information on the risks of high blood pressure, training on a home blood pressure monitoring device, and the opportunity to have questions addressed. Patients will receive a blood pressure monitoring device for home use. Patient demographic and medication information will be gathered and a blood pressure reading will be taken at the time of the education session. Patients will be instructed to submit their blood pressure readings semi-monthly via a secure electronic message system for review by the pharmacy resident. The pharmacy resident will record the blood pressure readings and provide medication adjustment suggestions via secure electronic message to the patients health care provider as indicated by the submitted blood pressure readings. Patients will be monitored for a six-month period. Outcome data of blood pressure readings and medication information will be collected. Data will be analyzed descriptively, including pre- and post-intervention blood pressure readings and the number of patients who reach blood pressure goal.

Results/Conclusions:
To be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Identify characteristics which predispose patients to having resistant hypertension.
List the limitations that home blood pressure monitoring (HBPM) is able to overcome when compared to ambulatory blood pressure monitoring.

Self Assessment Questions:
Which of the following patient characteristics is associated with resistant hypertension?
A: male gender
B: high baseline systolic blood pressure
C: residence in the midwestern United States
D: Mediterranean diet

Which of the following statements regarding home blood pressure monitoring is true?
A: The cost of home blood pressure monitoring is generally reimbursable
B: Blood pressure taking technique is not important with the use of el
C: Home blood pressure monitoring can be used successfully in all ty
D: Home blood pressure measurements are more reproducible over t

Q1 Answer: B Q2 Answer: D

ACPE Universal Activity Number 121-999-11-056 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

ASSESSMENT OF INPATIENT WARFARIN MANAGEMENT IN A VETERANS AFFAIRS MEDICAL CENTER

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Statement of Purpose: The purpose of this study is to evaluate current inpatient warfarin management procedures and related patient outcome: at the RL Roudebush VAMC.

Statement of Methods Used: A report of patients discharged with warfarin between January 1, 2010 and June 30, 2010 was generated and a retrospective review conducted using documented patient data from the electronic medical record. Patients started or continued on warfarin in inpatients during this time were randomly selected and their chart reviewed for medical service initiating warfarin, warfarin indication, dose prescribed, adverse events related to anticoagulation, and time to follow up. Whether warfarin was dosed based on an established warfarin protocol was noted, as well as if patient education was provided. Collection and analysis of this data will help determine if new processes should be developed in regard to inpatient warfarin management.

Data Collection/Analysis: Prior to initiation of this study, approval through IUPUI IRB and VA Research and Development Committee was obtained. Patients who were started or continued on warfarin as an inpatient from January 1, 2010 - June 30, 2010 were included. From that group of patients, subjects were randomly selected to achieve n=200. At patient data was collected from the electronic medical record using a standardized data collection form. The following data was obtained from each patient chart: age and gender, chronic warfarin user versus newly started on therapy, warfarin indication and home warfarin dose, dosage adjustments while inpatient and corresponding INRs, reasons for held doses, need for Vitamin K or fresh frozen plasma, need for bridging therapy, discharge dose, warfarin-related events during stay, and readmission for a warfarin-related event within 30 days of discharge. Data was analyzed using descriptive statistics. A chi-square test was used to analyze nominal data and a students t-test to analyze continuous INR data.

Conclusions: Pending at time of submission.

Learning Objectives:
List the factors affecting inpatient warfarin use and how pharmacists can improve safety and efficacy of inpatient anticoagulation.

Translate the information from this presentation to your health-system to enhance patient safety related to anticoagulation therapy.

Self Assessment Questions:
Previously available data regarding pharmacist involvement in inpatient management of anticoagulation reveals which of the following?
A: Lower anticoagulation-related mortality
B: Increased number of bleeding complications
C: Reduced cost of therapy
D: Both A and C

Which of the following statements is true?
A: Strictly protocol driven inpatient anticoagulation is the optimal method
B: Pharmacist-managed inpatient anticoagulation programs result in
C: Pharmacist-managed inpatient anticoagulation programs are not s
D: Pharmacist-managed inpatient anticoagulation programs are too c

Q1 Answer: D Q2 Answer: B

ACPE Universal Activity Number 121-999-11-490 -L05-P
Activity Type: Knowledge-based Contact Hours: 0.5
USING MINI-BAL-OBTAINED RESPIRATORY CULTURES TO GUIDE ANTIMICROBIAL THERAPY IN PATIENTS WITH PNEUMONIA
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Purpose:
This study was designed to determine the influence of mini-bronchoalveolar lavage (mini-BAL)-obtained respiratory cultures on the selection or de-escalation of antimicrobial therapy in mechanically ventilated patients with suspected pneumonia.

Methods:
Mechanically ventilated patients who underwent a mini-BAL procedure to obtain a respiratory sample were retrospectively reviewed. All patients were treated in an intensive care unit at Sparrow Hospital between November 2009 and December 2010. Subjects charts were reviewed for date of admission, reason for admission, date of mini-BAL procedure, antibiotics received during hospitalization, results of the mini-BAL-obtained cultures, and antibiotic changes made subsequent to culture results. Other important information collected included classification of the mini-BAL-obtained sample, incidence of reported normal flora, and presence of concurrent infections that may have affected antibiotic selection. Cultures with no growth or isolation of a single organism were separated from those with reported normal flora. Changes in antibiotic therapy as a result of a negative culture or isolation of a specific organism were then assessed and a cost analysis was performed.

Results/Conclusion:
112 mini-BAL procedures were retrospectively evaluated and a plan was developed to optimize cost savings based on the findings. The plan included strategies for improving the methods of labeling mini-BAL-obtained samples, decreasing the number of patients who received more than one mini-BAL procedure during a single hospital stay, decreasing the frequency of reporting normal flora, and increasing the frequency of reporting all organisms present in a sample. Details of the results and proposed plan will be presented at the Great Lakes Residency Conference.

Learning Objectives:
Describe the patient population that may benefit from a mini-BAL procedure.
Discuss the potential advantages of performing a mini-BAL to obtain a respiratory culture versus other collection methods for suspected pneumonia.

Self Assessment Questions:
Which of the following patients would be a candidate for a mini-BAL procedure?
A: A patient experiencing a congestive heart failure exacerbation
B: A patient with community-acquired pneumonia who needs outpatient therapy
C: A patient with hospital-acquired pneumonia who does not have an underlying condition requiring hospitalization
D: A patient who is receiving mechanical ventilation and has a suspected pneumonia

Which of the following is a potential advantage of performing a mini-BAL on a patient with suspected pneumonia?
A: The sample obtained is less likely to be contaminated with normal flora
B: The patient does not have to be intubated to receive a mini-BAL procedure
C: The mini-BAL procedure can be performed on an outpatient basis
D: The mini-BAL procedure replaces the need for an expensive chest X-ray

Q1 Answer: D Q2 Answer: A

ACPE Universal Activity Number 121-999-11-053 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

EFFICACY OF DEXMEDETOMIDINE USE FOR SEDATION IN A MIXED SURGICAL, TRAUMA, AND BURN POPULATION
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Purpose:
The purpose of this project is to evaluate the use of dexmedetomidine in a population of surgical, trauma, and burn patients. Specifically, we aim to assess dexmedetomidine in terms of efficacy in achieving sedation goals, ability to wean other agents, facilitation of extubation, and preventing symptoms of withdrawal.

Methods:
This is a retrospective, observational study which will characterize and assess the use of dexmedetomidine in the surgical, trauma, and burn intensive care units (ICUs) at Wishard Memorial Hospital, a 350-bed safety net hospital, and Methodist Hospital, an 800-bed hospital, both level I trauma centers located in Indianapolis, IN. Patients will be included into this study if they were admitted to either hospital between January 2005 and December 2010, age 18 or older, received dexmedetomidine for sedation in the ICU, and were classified as a surgical, trauma, or burn patient. Exclusion criteria include dexmedetomidine infusion duration less than two hours, no documentation of sedation scores, concomitant use of neuromuscular blockade, prisoner status, and pregnancy or lactation. The primary endpoint of this study will be the percentage of sedation scores within goal range in patients receiving dexmedetomidine. Patients will serve as their own control, with sedation scores for 24 hours before dexmedetomidine initiation being compared to sedation scores up to 72 hours after dexmedetomidine initiation. Key secondary endpoints which will be compared in patients before and after initiation of dexmedetomidine include: average doses of other sedative or analgesic infusions, use of antipsychotic medications or clonidine, and incidence of adverse events. In addition, length of stay in hospital and ICU, time to extubation, and incidence of self-extubation or reintubation will also be assessed.

Results:
Results and conclusions to follow upon completion of data collection.

Learning Objectives:
Discuss the proposed advantages of using dexmedetomidine for sedation in the ICU.

Self Assessment Questions:
Dexmedetomidine exerts its sedative effects through action on which of the following receptors?
A: GABA receptors
B: Central α-2 receptors
C: NMDA receptors
D: Nociceptors

Recent literature has evaluated which of the following potential advantages of dexmedetomidine use:
A: Lower incidence of ICU delirium
B: Less incidence of hypotension and bradycardia compared to other agents used for sedation in the intensive care unit (ICU)
C: Shorter duration of mechanical ventilation
D: A and C

Q1 Answer: B Q2 Answer: D

ACPE Universal Activity Number 121-999-11-306 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
INCIDENCE OF ACUTE KIDNEY INJURY ASSOCIATED WITH VANCOMYCIN WITH OR WITHOUT PIPERACILLIN/TAZOBACTAM

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Background:
Hospitalized patients who experience even moderate alterations in renal function have a significantly increased risk of mortality and hospital length of stay. Nearly 20% of acute kidney injury cases are attributed to medication-induced causes yet are often preventable. Vancomycin has historically been attributed to acute kidney injury (AKI), but published data supporting an increased risk with concurrent medications is limited to aminoglycosides. Following an institutional practice change resulting in the increased use of combination vancomycin plus piperacillin/tazobactam therapy, clinicians anecdotally noted a trend towards increased AKI. The purpose of this study is to evaluate the incidence of AKI in hospitalized patients receiving combination vancomycin and piperacillin/tazobactam therapy in comparison to vancomycin therapy. The primary objective of this study is to evaluate if an increased risk of AKI is present in patients receiving combination vancomycin and piperacillin/tazobactam therapy. Secondary endpoints include mortality and hospital length of stay associated with AKI.

Methods:
Patients receiving more than 3 days of vancomycin therapy were identified and categorized into two groups those receiving combination vancomycin plus piperacillin/tazobactam and those receiving vancomycin. Patients were excluded for the following conditions: chronic kidney disease currently on hemodialysis, acute kidney injury within 48 hours of start of vancomycin, and use of predefined concurrent nephrotoxic medications. Acute kidney injury was defined as an increase in serum creatinine (SCr) ≥ 0.5 mg/dL or an increase in baseline SCr ≥ 50% on 2 consecutive days.

Results/Conclusions:
Data collection and analysis is ongoing. Study results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Describe risk factors and identify patients at increased risk for vancomycin-associated acute kidney injury.

Self Assessment Questions:
Which of the following risk factors have been associated with vancomycin-induced acute kidney injury in studies?
A: Duration of vancomycin use > 5 days
B: Trough levels > 5 mg/dL
C: Duration of vancomycin use > 14 days
D: Administration of vancomycin with concurrent beta-lactam antibiot

How do current ASHP/ISDA guidelines define vancomycin-induced nephrotoxicity?
A: An increase in SCr > 2.0 mg/dL
B: Decrease in CrCl (Cockcroft-Gault) to < 50 ml/min
C: Two or more consecutively high SCr levels by an increase of 0.5 mg/dL
D: Increase in SCr to > 1.5 mg/dL

Q1 Answer: C  Q2 Answer: C

ACPE Universal Activity Number 121-999-11-193-L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5

PANCREAS TRANSPLANT OUTCOMES: A SINGLE-CENTER EXPERIENCE WITH STEROID AVOIDANCE

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Purpose: The purpose of this study is to compare the outcomes of pancreas transplant patients at the University of Illinois Medical Center at Chicago (UI-MCC) treated with a maintenance steroid-based versus a steroid-free immunosuppressive regimen. We aim to determine if the change in practice of no longer administering steroids past the fifth post-operative day is a safe and effective strategy without adversely affecting graft and patient survival rates and to elucidate if such a strategy provides the added benefit of improving classic parameters of carbohydrate and lipid metabolism. We also aim to identify factors to predict which pancreas transplant recipients would have the highest likelihood of successful steroid withdrawal.

Methods: This study is a retrospective chart review. All adult subjects presenting to UI-MCC receiving pancreas transplants between January 1, 1997 and October 1, 2010 will be included in the study. To be eligible for evaluation, patients must have had a minimum of 6 months of follow-up post-transplant. No patients will be excluded based on ethnicity, gender, or age (except for the exclusion of pediatric patients). Approximately 10% patients will be evaluated. Subjects will be identified by obtaining a master list from the transplant data coordinator of all pancreas transplants performed in the pre-specified time period. From this list, medical and pharmacy records will be reviewed for all patients presenting for pancreas transplant during the study period. The primary outcome is the incidence of patient and graft survival. Pancreas graft failure is defined as removal of the graft, loss of endocrine function (confirmed by absence of c-peptide), or death with a functioning graft. The secondary outcome is the difference in metabolic parameters between patients receiving maintenance steroids versus those without maintenance steroids.

Results: Data collection and analysis for this study are currently ongoing

Learning Objectives:
Identify various strategies used for managing maintenance immunosuppression in patients post-pancreas transplant. Describe the proposed benefit of a steroid-free maintenance immunosuppressive regimen in the setting of pancreas transplantation.

Self Assessment Questions:
Which of the following is an example of a traditional maintenance immunosuppressive regimen for pancreas transplantation?
A: Calcineurin inhibitor + antimetabolite + corticosteroid
B: m-TOR inhibitor + antimetabolite
C: Polyclonal antibody + corticosteroid
D: Calcineurin inhibitor + m-TOR inhibitor

What is the proposed main benefit of a steroid-free maintenance immunosuppressive regimen in pancreas transplantation?
A: To decrease the doses of calcineurin inhibitors
B: To improve metabolic parameters
C: To improve patient survival after transplant
D: To reduce acute rejection rates

Q1 Answer: A  Q2 Answer: B

ACPE Universal Activity Number 121-999-11-087-L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
BUILDING INPATIENT ANTICOAGULATION SERVICES THROUGH UTILIZATION OF A CLINICAL PHARMACY SERVICES COLLABORATIVE

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Background/Purpose: Studies have shown that patient education and medication therapy management improve health behaviors, health status, and ultimately lead to decreased health care costs. To improve these outcomes and better facilitate the transition of care at John H. Stroger, Jr. Hospital, we are establishing an inpatient anticoagulation service. Currently, outpatient anticoagulation services are provided through a multi-disciplinary team, with patients managed by their primary care physicians until they are referred to the clinic. Working with the Patient Safety and Clinical Pharmacy Services Collaborative (PSPC), sponsored by the Health Resources and Services Administration (HRSA), we began this inpatient service to smooth transition of warfarin management to the outpatient setting. The objective is to provide inpatient warfarin education, collaborate with medical teams to assess/adjust anticoagulation therapy, and to reduce adverse events and time to therapeutic INR range.

Methods:
This is a prospective controlled intervention study with recruitment occurring from November 2010 to November 2011. Inclusion criteria consist of patients age 18 and over, from the general medicine inpatient services newly initiated on warfarin therapy. Clinical pharmacists collaborate with the medical team to manage warfarin therapy. Patients are given warfarin education while in the hospital. Retention of education is assessed through a baseline pre-test and subsequent post-test following the education session. Discharge planning is discussed with the patient and follow-up is arranged in the outpatient clinic within a week. Primary outcomes include time to reach therapeutic INR range, occurrence of adverse events, and retention of education. Secondary outcomes include self-reported adherence to therapy, occurrence/recurrence of VTE, atrial fibrillation, or stroke, and re-hospitalization. The goal is to recruit 40 patients through April 2011 whose results will be compared to a historical control group.

Results/Conclusion:
Data collection and analysis is ongoing. Results will be presented at the Great Lakes Residency Conference.

Learning Objectives:
Identify key points of patient education on warfarin therapy and the impact of such education on patient-centered outcomes.
Describe the importance of establishing an inpatient anticoagulation service for obtaining and maintaining therapeutic INR levels.

Self Assessment Questions:
Patients started on warfarin therapy should be counseled on which of the following?
A: Importance of INR testing
B: Side effects of warfarin
C: Signs and symptoms of a bleed or clot
D: All of the above

Providing patient education has been shown to:
A: have no impact on patient outcomes
B: improve health behavior and health status of the patient
C: increase the rate of occurrence of adverse events
D: lead to an increase in health care costs

Q1 Answer: D  Q2 Answer: B

ADHERENCE TO A RECENTLY IMPLEMENTED INTENSIVE CARE UNIT SEDATION PROTOCOL AND EFFECTS ON PATIENT OUTCOMES

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BACKGROUND: Critically ill patients often require mechanical ventilation (MV) to support respiration and current practice is to provide sedation for most of these patients. Excessive sedation has been shown to increase the duration of MV, time in the intensive care unit (ICU), hospital length of stay, and nosocomial complications such as ventilator associated pneumonia. Within the past year, Froedtert Memorial Lutheran Hospital (FMLH) implemented an evidence-based ICU sedation protocol attempting to standardize the use of sedation, analgesia, and spontaneous breathing trials with patients on MV. Evaluating and implementing strategies to improve compliance with or optimize the current protocol may aid in improving the care of MV patients.

METHODS: This study is a prospective, single-center, observational study evaluating the use of the ICU sedation protocol at FMLH. Data is being gathered from the electronic medical records of ICU patients at FMLH who have been on MV for at least 48 hours and met inclusion criteria for protocol use. Data being collected is focused on adherence to the protocol as well as proper documentation in the medical record. After analysis of protocol utilization and adherence, interventions will be made to optimize protocol use. After these implementations are made, protocol compliance and patient outcomes will be reevaluated. The primary outcome of the study is adherence with the protocol.

PRELIMINARY RESULTS: Data has been collected for the pre-intervention cohort consisting of sixty-one patients. An interdisciplinary rapid sequence improvement group recently met and identified ways to improve compliance to and optimize the current protocol. The new protocol is being piloted in the Surgical ICU and will be instituted in all FMLH ICUs. Post-intervention data will be collected and assessed for the primary outcome in relation to pre-intervention data.

CONCLUSIONS: Results will be presented at Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Discuss the current literature describing the impact of spontaneous awakening trials and spontaneous breathing trials on mechanically ventilated patients.
Describe the key concepts in the management of patient-focused sedation and analgesia in the ICU.

Self Assessment Questions:
Which of the following statements is true regarding the Awakening and Breathing Controlled trial?
A: Patients in the intervention group spent statistically significant less time ventilated
B: Patients in the intervention group spent statistically significant less time in the ICU
C: More patients in the control group self-extubated compared to the intervention group
D: The number of patients who required reintubation was statistically significant

Which of the following is true regarding key concepts for management of sedation and analgesia?
A: Decide which discipline should be in charge of managing sedation and analgesia
B: Titrate analgesic and sedative drugs to a defined target, using the patient’s response
C: Perform and document structured evaluation and monitoring on a regular basis
D: Focus first on sedation, then analgesia.

Q1 Answer: B  Q2 Answer: B
LINEZOLID VERSUS VANCOMYCIN FOR METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS (MRSA) RESPIRATORY TRACT INFECTIONS IN THE CRITICALLY ILL

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Purpose: American Thoracic Society Infectious Disease Society of America guidelines currently recommend linezolid as an alternative to vancomycin for MRSA nosocomial pneumonia. The objective of this study is to assess the effectiveness of linezolid versus vancomycin for nosocomial MRSA lower respiratory tract infections (LRTI) in the intensive care units (ICUs) of a university hospital.

Methods: A retrospective chart review will evaluate ICU patients with MRSA LRTI cultures who received at least 72 hours of linezolid or vancomycin. All patients ≥ 18 years admitted between January 2009 and December 2011 were eligible if they had the following: LRTI acquired after 48 hours in the hospital or chronic care facility, purulent secretions in a bronchoalveolar lavage, MRSA lower respiratory tract culture positive within 72 hours of treatment initiation, and at least three symptoms of infection. Symptoms include radiographic evidence of new and/or progressive infiltrates, cough, new or worsened purulent sputum production, rales and/or signs of pulmonary consolidation, dyspnea, tachypnea, hypoxemia, temperature > 38°C or < 35°C, leukocyte count > 10,000 cells/mm3 or < 4500 cells/mm3, heart rate ≥ 120 beats per minute, mechanical ventilation, or systolic hypotension. Exclusion criteria includes patients with: documented infection other than MRSA inappropriately treated, bacteremia with organisms other than MRSA, anticipated survival of < 7 days, a known allergy to either agent, organisms resistant to either therapy, antibiotic changes within 72 hours of initiation, transplants, AIDS, leukemia, lymphoma, myeloma, or an absolute neutrophil count of ≤ 500 cells/mm3. The primary endpoint is the percent of patients with clinical success at the end of treatment. Secondary endpoints include time to extubation, time from antibiotic start to resolution of signs and symptoms, and length of ICU stay compared to days treated.

Results: Data collection and evaluation are ongoing. Final results will be presented at the conference.

Learning Objectives:
Review literature to support the use of linezolid and vancomycin in MRSA pneumonia.
Identify potential differences between linezolid and vancomycin with respect to patient outcomes.

Self Assessment Questions:
The current IDSA guidelines recommend which of the following to treat MRSA nosocomial pneumonia?
- A Vancomycin
- B Linezolid
- C Either vancomycin or linezolid
- D Vancomycin and linezolid together

Vancomycin treatment failures may be associated with all of the following EXCEPT:
- A Increasing MIC ≥ 2
- B Inadequate dosing
- C Use of hemodialysis
- D Decreased lung penetration

Q1 Answer: C Q2 Answer: C

OUTPATIENT PRESCRIPTIONS REQUIRING PHARMACIST INTERVENTION AT THE CINCINNATI VA MEDICAL CENTER (CVAMC)

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Purpose: Errors that threaten patient safety can originate during prescription ordering, processing, dispensing, and administration of medications. Studies have been published that evaluate errors associated with prescribing in the community and mail order pharmacy settings. The purpose of this study is to identify areas for improvement in the prescription prescribing process in order to decrease pharmacist time needed for clarification of outpatient prescriptions and improve patient safety at the CVAMC.

Methods: The primary endpoint of this observational review is to define the percent of prescription orders requiring clarification. Clarification is defined as actions the pharmacist performs to resolve any questions prior to processing a prescription. The secondary endpoint is to identify trends or patterns of orders requiring clarification, and to quantify the additional pharmacist time required to clarify prescription orders. All outpatient medication orders entered electronically into the electronic patient record requiring clarification prior to processing by specified pharmacists during a specified time period were included. Orders written on paper prescription blanks, verbal orders, and orders processed by outpatient pharmacists upon presentation of the patient were excluded. The pharmacists documented data over a one week period to achieve a sample size of at least 3000 prescriptions reviewed, for 80% power. Medication(s) needing clarification, the provider, the amount of pharmacist time required clarifying the order, and the method of clarification were collected. The pharmacist assigned a clarification reason: justification of non-formulary or restricted medication; dose discrepancy; existing allergy, adverse drug event, or contraindication; drug interaction or therapeutic duplication; and other for each prescription.

Results/Conclusions: Data collection has been completed and analysis is in progress. Results and conclusions to be presented at the Great Lakes Residency Conference.

Learning Objectives:
Discuss rates of and reasons for prescription clarification.
Identify pharmacist time required for clarification.

Self Assessment Questions:
In the private sector, what percent of outpatient prescriptions have necessitated pharmacist clarification?
- A < 1%
- B 1-10%
- C 10-15%
- D >15%

At the Cincinnati VA, most prescriptions requiring clarification were resolved in what amount of time?
- A < 5 minutes
- B 5-10 minutes
- C 10-20 minutes
- D > 20 minutes

Q1 Answer: B Q2 Answer: A

ACPE Universal Activity Number 121-999-11-475 -L05-P
Activity Type: Knowledge-based Contact Hours: 0.5
ENOXAPARIN DOSING FOR VENOUS THROMBOEMBOLISM (VTE) PROPHYLAXIS IN OBESITY

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Enoxaparin is approved for VTE prophylaxis in high risk patients at a dose of 40mg subcutaneously (SQ) daily or 30mg SQ every 12 hours. Published clinical studies in bariatric surgery recommend a dose increase to 40mg SQ every 12 hours for obese patients exceeding 150kg or body mass index greater than 40kg/m². At William Beaumon Hospitals - Troy, approximately 15,000 doses of enoxaparin are dispensed annually. A review revealed that approximately 25% patients receiving pharmacologic VTE prophylaxis receive enoxaparin. Due to the number of doses dispensed and the increase in obesity, an evaluation of safety and efficacy of the approved enoxaparin dose for thromboprophylaxis in the obese population is warranted. A retrospective review will be performed on patients initiated on enoxaparin for VTE prophylaxis between 8/1/2009 and 7/31/2010. Patients will be identified using the electronic medical record database. The first 50 obese patient receiving at least one dose will be evaluated against the first 50 non-obese patients receiving at least one dose. Criteria for exclusion include <18 years, treatment dose enoxaparin, estimated creatinine clearance <30mL/min or dialysis, or incomplete medical record. Demographic and baseline information collected will include gender, age, height, weight, admission/discharge date, hospital unit. Laboratory data collection will include daily hemoglobin, hematocrit, serum creatinine. Renal function and transfusion requirements will be evaluated. Efficacy endpoints include any new diagnosis of blood clot after initiation of enoxaparin. Safety endpoints include major bleeding during enoxaparin therapy defined as a) more than 2g/dL reduction in hemoglobin or b) bleeding requiring transfusion of at least 2 units of packed red blood cells or c) documented intracranial, intraocular, or fatal bleeding. Resources for review of data will include electronic medical record database and medical records/charts. This study has been approved by the Human Investigation Committee.

Learning Objectives:
Discuss the rationale for higher enoxaparin dose for VTE prophylaxis in obese patients.
Identify the correct dosing of enoxaparin for thromboprophylaxis in obese patients.

Self Assessment Questions:
Which of the following statements regarding BMI is true?
A: BMI is calculated by dividing the patient’s weight by the patient’s height
B: A patient with a BMI greater than 25 is considered obese
C: Dosing of medications is exceptionally difficult in patients with a BMI greater than 25
D: Most clinical studies investigating drug dosing in obese patients have been performed on patients with a BMI greater than 25

Which of the following statements is true?
A: There are many large randomized controlled trials describing unfr
B: There are many large randomized controlled trials describing low-r
C: Dose adjustments for thromboprophylaxis with enoxaparin are nec
D: Obese patients are generally overdosed with enoxaparin for throm

Q1 Answer: C  Q2 Answer: C

ACPE Universal Activity Number 121-999-11-286 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
EVALUATING INCIDENCE OF HYPOGLYCEMIA WITH NPH INSULIN IN THE INPATIENT GENERAL WARD AT A VETERANS AFFAIRS MEDICAL CENTER

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Purpose:
Hypoglycemia has been associated with an increased length of hospital stay and higher mortality rates in the inpatient general ward. At the Richard L. Roudebush Veterans Affairs Medical Center (RLR VAMC), the administration of NPH insulin four times daily (QID) was designed to mimic basal insulin as part of the inpatient glucose management protocol. The dosing of NPH QID was initiated four years ago at the RLR VAMC to decrease the incidence of hypoglycemia by more frequent administration of NPH at lower doses compared to twice daily (BID) NPH. The purpose of this study is to assess whether QID dosing of NPH insulin results in fewer events of hypoglycemia than BID NPH insulin.

Methods:
This is a retrospective, observational study including data from January 2009 to May 2010. Data was generated electronically to select for patients who received either BID or QID NPH insulin in the inpatient general medicine ward of the RLR VAMC. Patients were be divided into two groups: BID and QID NPH insulin. Patients were excluded if they received NPH insulin for less than 48 hours or received NPH in the intensive care unit or step down units only. Both BID and QID NPH groups were analyzed for incidence of hypoglycemia. Blood glucose (BG) cutoffs were ≤60 mg/dL for hypoglycemia. Initial computer analyses showed a higher incidence of hypoglycemia in the BID group versus QID. A random selection of patients in both treatment arms will be chosen for more detailed chart review. Pertinent patient demographic data, diagnoses, laboratory values, and risk factors for hypoglycemia will be collected. The purpose of the detailed chart review is to look for potential causes of hypoglycemia including acute renal failure, infection, medication errors, pancreatic disease, and timing of NPH insulin administration.

Results:
Initial results obtained
Final results in progress

Learning Objectives:
Discuss the importance of blood sugar management in the inpatient general medicine ward.
Identify reasons why hypoglycemia in patients receiving NPH insulin occurred more frequently in BID or QID administration.

Self Assessment Questions:
Which of the following are associated with hypoglycemia in the inpatient general medicine ward?
A: Increased hospital length of stay
B: Increased mortality
C: Medication errors in insulin dosing
D: All of the above

QID NPH insulin administration was designed to decrease incidence of hypoglycemia by
A: Giving the same daily dose of insulin as the patient's home dose
B: Producing smaller peak concentrations of NPH insulin compared to
C: Producing similar peak concentrations of NPH insulin compared to
D: Producing larger peak concentrations of NPH insulin compared to

Q1 Answer: D Q2 Answer: B

EVALUATION OF A PHARMACIST-DRIVEN LAB MONITORING REMINDER PROCESS IN A VETERANS POPULATION

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Background/Purpose: Although lab monitoring is essential in guiding therapy, assessing efficacy, and preventing adverse events, compliance remains low and inconsistent among patients. The purpose of this study is to assess the effectiveness of a pharmacist-driven reminder intervention with a customized comment added to the prescription label and/or mailing patients a reminder letter in increasing patient compliance with laboratory monitoring. The impact of these interventions on patient safety and medication efficacy will also be evaluated.

Methods: This is a retrospective chart review of veterans from Jesse Brown VA Medical Center who are prescribed medications which require routine laboratory monitoring. An electronic list of patients prescribed target prescriptions with a customized comment added on the prescription label advising them to complete lab monitoring will be generated from the computerized patient record system (CPRS) between January 1, 2008 and August 15, 2010. Patients who received a reminder letter advising them to complete labs were documented separately in a log maintained by the outpatient pharmacy, which will serve as a second comparative group. Patients who received prescriptions with a customized comment added to the label and a reminder letter will be counted as a third comparative group. Patients who do not meet the above criteria will be excluded. Patients will be tracked until the end of the follow-up period (September 15, 2010). Primary outcome will include compliance rates after a reminder intervention with the customized prescription label comments alone, letters alone, or both. Secondary outcomes will include the number of suboptimal lab results and subsequent interventions made in response to these results.

Results/Conclusion: The study is in the data collection phase. Final results with conclusions will be presented at the Great Lakes Pharmacy Conference.

Learning Objectives:
List medications which require routine laboratory monitoring.
Identify potential areas for pharmacist impact on optimizing patient compliance rates with routine laboratory monitoring.

Self Assessment Questions:
Which medication requires routine complete blood counts (CBC)?
A: There is no statistically significant survival advantage between rats
B: Lisinopril
C: Sevelamer
D: Tacrolimus

Which of the following is true about pharmacists’ role in optimizing patient compliance with laboratory monitoring?
A: Pharmacists may not contact patients to remind them to complete
B: Patients are more compliant and respond better to physician-drive
C: Pharmacists may improve compliance with routine laboratory mon
D: Pharmacists do not affect patient safety by reminding patients to c

Q1 Answer: D Q2 Answer: C

ACPE Universal Activity Number 121-999-11-458 -L05-P
Activity Type: Knowledge-based Contact Hours: 0.5
Purpose: To determine if the administration of "as needed" IV antihypertensive therapy is associated with blood pressure control, chronic antihypertensive therapy adjustments or adverse events.

Methods: This study was a prospective chart review of patients prescribed IV hydralazine, enalapril, labetalol or metoprolol from November 2010 to January 2011 in a large academic teaching hospital. Patients were excluded if < 18 years or > 89 years of age, admitted to an ICU, receiving nothing by mouth, were pregnant, had a renal transplant in the past 3 months, were diagnosed with aortic dissection or had acute neurologic syndrome. The following demographic data was collected on all included patients: age, race, sex, height, weight. In addition, length of stay, hypertension classification per JNC 7 guidelines from admission through discharge, JNC 7 blood pressure goal, antihypertensive regimen prior to admission and at discharge, diet restrictions, baseline/discharge labs and vitals, average daily blood pressure readings, and concomitant exacerbating medication orders were collected. To analyze the impact of "as needed" IV antihypertensive therapy, the antihypertensive therapy ordered and administered (number, date, prescriber type, service and time of doses administered, and criteria for use), occurrence of antihypertensive therapy related adverse outcomes/interventions required, and adjustments to oral antihypertensive therapy during admission or upon discharge were recorded.

Preliminary Results: 300 total patients will be evaluated for this study. Currently, 99 patients with a prescription for IV antihypertensives have been identified, with 38 meeting inclusion criteria. Of the 38 patients the average age was 61 years, 66.7% were male, and 92.3% were African American. The most commonly prescribed IV antihypertensive was hydralazine (93%), followed by labetalol (6%), and metoprolol (1%). Adverse events were noted in 1 patient (tachycardia). Further data analysis ongoing.

Conclusions: To be presented at the 2011 Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Describe the clinical challenge that uncontrolled or resistant hypertension poses in hospitalized patients.
Discuss the potential impact of "as needed" antihypertensive therapy on patient outcomes.

Self Assessment Questions:
Resistant hypertension is defined as
A Blood pressure above goal despite the use of ≥ 3 antihypertensive agents
B Blood pressure above goal in patients non-adherent to their antihypertensive therapy
C Blood pressure above goal with use of an inadequate antihypertensive agent
D Blood pressure within goal requiring ≥ 3 antihypertensive agents or
Management of non-sustained transiently elevated blood pressure in the range of urgency
A require "as needed" intravenous antihypertensive therapy
B is not addressed in JNC 7 guidelines
C require rapid lowering to prevent adverse outcomes
D is a well defined practice

Q1 Answer: A Q2 Answer: B

Activity Type: Knowledge-based Contact Hours: 0.5

THE IMPORTANCE OF AN ACCELERATED GI CAREPATH WITH THE USAGE OF ALVIMOPAN IN ELECTIVE BOWEL RESECTION
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PURPOSE: Post-operative ileus related to large and small bowel resection is a major adverse event and is associated with negative patient outcomes. Costs associated from increased length of stay, increased nursing time and additional treatments are estimated to be approximately $1.5 billion per year in patients who experience post-operative ileus occurs. The incidence of post-operative ileus is dependent on many intra-operative factors such as surgical trauma, bowel manipulation and post-operative analgesia. Alvimopan is a peripherally acting mu-opioid antagonist indicated in small and large bowel resection to reduce the overall time to discharge. The benefit of this medication is only maximally realized when used in combination with an accelerated care path that includes early removal of the NG tube, clear liquid diet and ambulation on day 1 and solid food on day 2. The benefit of this medication in patients who are not compliant with the accelerated care path has not been established. The primary objective of this study is to determine the compliance of the accelerated care path and the reduction in overall length of stay realized by alvimopan usage.

METHODS: This is a retrospective chart review of patients admitted to Grandview Medical Center and Southview Medical Center for bowel resection with primary anastomosis. The primary objective of this study is determine whether alvimopan in combination with an accelerated care path reduces length of stay and time to discharge order written. Other factors such as use of post-operative analgesia will also be collected and analyzed.

RESULTS: To be presented at the Great Lakes Pharmacy Residency Conference

Learning Objectives:
Describe compliance with the accelerated GI carepath when used with alvimopan.
Report the average length of stay for elective bowel resection and overa alvimopan utilization at an academic medical center.

Self Assessment Questions:
According to an economic analysis completed by Bell et al., the potential savings realized by reducing length of stay with alvimopan usage is estimated to be which of the following?
A $500
B: $1000
C: $1500
D: $2000

Compliance with the accelerated care path includes which of the following?
A Removal of NG tube during surgery if possible
B Clear liquid and ambulation on day 1
C Solid food on day 2
D More than one of the above

Q1 Answer: B Q2 Answer: D

ACPE Universal Activity Number 121-999-11-354 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
AN EFFECTIVENESS AND SAFETY COMPARISON BETWEEN CONTINUOUS INFUSION LOOP DIURETICS IN ACUTE DECOMPENSATED HEART FAILURE

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Background: Acute decompensated heart failure (ADHF) accounts for over 1 million hospitalizations a year in the United States and is one of the leading causes of hospitalization among people over 65 years of age. Patients with advanced heart failure or who require chronic diuretic therapy may exhibit a resistance to initial attempts at diuresis. Continuous infusion (CI) loop diuretics is one method of administration the ACCF/AHA 2009 guidelines recommend to overcome diuretic resistance in ADHF. Both bumetanide and furosemide may be administered as CI, but there are no studies comparing the efficacy of these agents when administered as an CI in patients with ADHF.

Methods: This is a single-center retrospective cohort of patients on CI bumetanide or furosemide with an admission diagnosis of ADHF. Patients will be identified using hospital database analysis and chart review. Inclusion criteria includes patients ages >18 and <89 , ADHF diagnosis, administration of CI bumetanide or furosemide for 48 consecutive hours. Exclusion criteria includes cross-over between bumetanide or furosemide during 48 hour CI, pregnancy, serum creatinine >2.5 mg/dL within 24 hours prior to CI, end stage renal disease, cirrhosis, cardiogenic shock, intraaortic balloon pump or renal replacement during hospitalization, cardiothoracic surgery and left ventricular assist device. Patients will be cross-matched according to equivalent doses of CI furosemide or bumetanide.

The primary objective is to determine if equivalent cumulative doses of CI furosemide and CI bumetanide are equally effective at providing 48 hour net urine output in ADHF. Secondary endpoints include net urine output at 8, 16, 24, 32, 40 hours after CI initiation, length of hospital stay, serum potassium <3.5 mmol/L, serum magnesium <1.6 mmol/L, total potassium and magnesium replacement, and systolic blood pressure <90 mmHg during CI.

Results: Data collection and analysis are currently being conducted.

Learning Objectives:
Review the 2009 ACCF/AHA Guidelines recommendations to overcome diuretic resistance.
Explain the benefits associated with administering loop diuretics as a continuous loop infusion compared to intermittent bolus injections.

Self Assessment Questions:
Which of the following statements is correct?
A: Change furosemide 40 mg by mouth every 8 hours to 20 mg IV every 4 hours.
B: Start bumetanide 2 mg IV with furosemide 40 mg IV
C: Discontinue loop diuretic and start a thiazide diuretic by mouth as needed.
D: Initiate a continuous loop diuretic infusion

Which of the following statements is correct about administering loop diuretics as a continuous infusion compared to intermittent bolus injections?
A: Continuous infusion allows for periods of sodium retention.
B: Diuretic response can be titrated with a continuous infusion.
C: Administration as a continuous infusion has increased side effects.
D: Continuous infusion is not effective in diuretic resistance.

Q1 Answer: D Q2 Answer: B

EFFECT OF INTRAVENOUS PRODUCT BATCH PROCESS CHANGE ON WASTE, WORKLOAD, AND DISPENSING ERRORS AT A COMMUNITY HOSPITAL INPATIENT PHARMACY

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PURPOSE:
The purpose of this study is to reduce waste associated with batch preparation of intravenous (IV) products by increasing the number of IV batch products from two to four per day. Secondary aims include decreasing overall workload and reducing dispensing errors.

BACKGROUND:
The Grant Medical Center (GMC) Department of Pharmacy employs a hybrid medication distribution model. Previously, the central pharmacy prepared IV medications in two batches and dispensed approximately 350 IV doses per day. Doses were prepared up to a maximum of 28 hours prior to scheduled administration. Waste occurs when medication preparation is duplicated, when already-prepared medications are discontinued prior to medication administration, and when product expires. Significant staffing and financial resources are devoted to the preparation and delivery of IV medications.

METHODS:
IV batch productions and IV product deliveries were increased from 2 to 4 per day. A retrospective, report based analysis will be used to compare baseline (pre-implementation) data to post-implementation data. Metrics to be assessed will include:
- Number of IV products wasted and associated costs
- Technician time per IV preparation / delivery task
- Number of nursing requests for missing doses
- Number of IV products prepared in each batch
- Number of dispensing errors

RESULTS/CONCLUSIONS:
Pending.

Learning Objectives:
Describe how increasing the number of IV batches affected waste at Grant Medical Center (GMC).
Describe how increasing the number of IV batches affected workload at Grant Medical Center (GMC).

Self Assessment Questions:
Which of the following statements is correct?
A: Increasing IV batches increased the dollar amount of waste at GMC.
B: Increasing IV batches had no effect on the dollar amount of waste.
C: Increasing IV batches decreased the dollar amount of waste at GMC.
D: The results were inconclusive.

Which of the following statements is correct?
A: Increasing IV batches increased the number of requests for missing IV products.
B: Increasing IV batches had no effect on the number of requests for missing IV products.
C: Increasing IV batches decreased the number of requests for missing IV products.
D: The results were inconclusive.

Q1 Answer: C Q2 Answer: C

ACPE Universal Activity Number 121-999-11-062-L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
**EFFECT OF A DAILY DRUG UTILIZATION PROCESS ON DRUG INVENTORY MANAGEMENT**

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**Purpose:** To describe the change in expense variation after implementing a daily drug utilization review process.

**Methods:** Retrospective data were collected to determine the expense variation in drug purchasing and characterize use. A proactive drug utilization review team (the team), consisting of directors of pharmacy, purchasing managers, and pharmacy technicians, was created to manage drug inventory through a daily drug utilization review process. A Microsoft Excel spreadsheet was developed to monitor drug use and discuss trends. Large variances in the cost of purchased drugs from the budget were investigated by the team. Additionally, daily action plans were developed to manage backorders and overstock. This information was communicated to key stakeholders on a regular basis in an effort to promote the rational use of medications.

**Results/Conclusions:** Results and conclusions are pending and will be presented at the Great Lakes Pharmacy Resident Conference.

**Learning Objectives:**

- List the reasons why drug inventory management is important at an academic medical center.
- Identify metrics that may be used to characterize drug inventory performance.

**Self Assessment Questions:**

- Why is managing a hospital's drug inventory so important?
  - A: Patient care may be compromised if drug inventory is not properly managed.
  - B: Cost of drugs is the second largest expense after salaries in a hospital.
  - C: Effective inventory management promotes the rational use of medications.
  - D: All of the above

- What are some metrics that may be used to describe a pharmacy department's effectiveness in managing its drug inventory?
  - A: Variance of drugs purchased from budgeted cost of drugs sold.
  - B: Inventory turn ratio.
  - C: Number of stock outs per month.
  - D: All of the above

Q1 Answer: D  Q2 Answer: D

**ACPE Universal Activity Number** 121-999-11-403-L04-P
**Activity Type:** Knowledge-based  **Contact Hours:** 0.5

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**IMPROVING VITAMIN K EDUCATION AT A HOSPITAL-BASED OUTPATIENT ANTICOAGULATION CLINIC**

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**Statement of Purpose:**

Vitamin K intake is an important factor influencing a patient's PT/INR and the success of their anticoagulation regimen. However, the educational materials provided to patients of anticoagulation clinics are often wanting. The readability of anticoagulation educational materials is of concern, as a prior study found the grade level of warfarin educational brochures to range from 7 to 18. The objective of this study is to examine the effect of using visually-based educational tools on patient understanding of INR and Vitamin K.

**Methods:**

Prior to commencement, this study will be presented to the Grant Medical Center/Doctors Hospital Institutional Review Board for approval. Educational materials have been developed that communicate the relationship between vitamin K and INR by using simple drawings and diagrams. Study participants will be drawn from patients at the Grant Medical Center Coumadin Clinic that have been managed for 90 days or more as of introduction of the new educational materials. In the four weeks prior to the introduction of the new materials, baseline data will be obtained for vitamin K and INR knowledge by means of a short questionnaire, and anticoagulation control by way of three months INR data. The new educational materials will then be introduced to the clinic. After eight weeks of use, another four week period will begin in which the questionnaire will be administered. Three more months of INR data post-intervention will also be obtained. These results will be compared to the ones prior to the use of the new educational materials to assess their effectiveness.

**Conclusions:**

Research is in progress.

**Learning Objectives:**

- Discuss the challenges of vitamin K education in outpatient anticoagulation clinics.
- Identify methods of improving education of the relationship between vitamin K and INR.

**Self Assessment Questions:**

- What is a common challenge with existing anticoagulation educational materials?
  - A: They are written at a high grade level.
  - B: They are too easy to read for many patients.
  - C: They use visual representations to explain concepts.
  - D: They are highly standardized.

- What is a novel method of educating patients on the relationship between vitamin K and INR?
  - A: Providing patients with high grade level written materials.
  - B: Using visual methods to educate patients on that relationship.
  - C: Encouraging patients to eliminate vitamin K from their diet.
  - D: There is no relationship between vitamin K and INR.

Q1 Answer: A  Q2 Answer: B

**ACPE Universal Activity Number** 121-999-11-315-L01-P
**Activity Type:** Knowledge-based  **Contact Hours:** 0.5
COMPARISON OF CUMULATIVE DRUG DOSES ADMINISTERED FOR SEDATION AND ANALGESIA DURING DAY AND NIGHT SHIFTS IN MECHANICALLY VENTILATED PATIENTS IN A MEDICAL INTENSIVE CARE UNIT

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PURPOSE: Drug accumulation and over-sedation can impair daily spontaneous awakening trials (SATs) and spontaneous breathing trials (SBTs), leading to prolonged duration of mechanical ventilation. Our objective was to determine if the cumulative drug doses utilized for sedation and analgesia vary between the day and night shift in mechanically ventilated patients.

METHODS: Fifty patients who were ventilated greater than 48 hours in the medical ICU between January-September 2009 and received intravenous benzodiazepines and/or propofol were retrospectively identified. The average dose of intravenous lorazepam equivalents, fentanyl equivalents, and/or propofol utilized was calculated for three time blocks of the day and comparisons were made using paired t-tests. Descriptive statistics were utilized for baseline demographics, sedation scores, SATs, and SBTs.

RESULTS: For propofol and fentanyl, the average dose utilized during the 2300-0659 time block was significantly greater compared to either the 0700-1459 or 1500-2259 time blocks. The mean paired difference between the 2300 time block and 0700 or 1500 blocks for propofol was 4.10.7 mcg/kg/min and 3.71.0 mcg/kg/min respectively (p<0.000, p<0.001). The mean paired difference between the 2300 time block and 0700 or 1500 time blocks for fentanyl was 4.21.0 mcg/hr and 3.01.0 mcg/hr respectively (p<0.000, p<0.005). There was no significant difference in drug utilization between time blocks for lorazepam. Sedation scores were not significantly different during any of the time blocks. SATs were performed during 55.837.5 percent of days. SBTs were performed during 42.428.2 percent of days.

CONCLUSIONS: Patients received a greater amount of propofol and fentanyl during the night shift than the day shift, however, the clinical significance of this difference appears minimal. Further investigation is needed to determine if over-sedation may have contributed to daily SATs or SBTs not being performed approximately half of the time.

Learning Objectives:
Identify drug-related barriers in performing daily wake up assessments and spontaneous breathing trials.
Describe the benefits of daily wake up assessments in mechanically ventilated patients.

Self Assessment Questions:
Which of the following is a reason to avoid performing a spontaneous awakening trial from sedatives?
A: No seizures in the past 24 hours
B: Neuromuscular blockade
C: Normal intracranial pressure
D: Mechanical ventilation less than 72 hours

Performance of spontaneous awakening trials may result in which of the following?
A: Increased ICU length of stay
B: Drug accumulation
C: Over-sedation
D: Decreased length of mechanical ventilation

Q1 Answer: B Q2 Answer: D

ACPE Universal Activity Number: 121-999-11-200 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

EFFECT OF AN INPATIENT HEART FAILURE PHARMACEUTICAL CARE PROGRAM ON 30-DAY HOSPITAL READMISSION RATES
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PURPOSE: Pharmacists are frequently consulted to evaluate medication regimens of patients admitted for heart failure (HF) at community hospitals. The objective of this study is to develop and evaluate an innovative pharmaceutical care program for patients admitted to a community hospital with HF.

METHODS: This prospective single-center, non-randomized study was performed over a three month period by a pharmacist or pharmacy resident. A pharmaceutical care program was developed and consists of a standardized HF pharmacy consult for medication evaluation and patient counseling. Main counseling points include HF disease state education, medication indication, mechanism of action and place in therapy, symptom management, lifestyle changes and smoking cessation. Patients with HF admitted during the six month pre-intervention phase who received standard care served as the comparator group. Patients with HF admitted in the three month post-intervention phase received the enhanced pharmaceutical services prior to discharge. The primary outcome measure was all cause 30-day hospital readmission rates and secondary outcome measures included 30-day emergency department visits and total length of stay.

PRELIMINARY RESULTS:
During the six months preceding program implementation, the mean all-cause HF readmission rate was 24.7%. The minimum and maximum readmission rate during this period was 11.8% and 37%, respectively. The all-cause HF readmission rate in the first and second month after program implementation at our institution was 27.6% and 17.2%, respectively. Further data collection and analysis is currently underway.

CONCLUSIONS:
Final results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Recognize methods that have been effective at reducing hospitalization for heart failure.
Recall the four core measures for heart failure management.

Self Assessment Questions:
In regards to hospital admissions for heart failure, which of the following statements is correct?
A: Pharmacists have been able to reduce hospitalizations related to HF
B: Pharmacists working independently are more effective than pharmacist
C: Heart failure readmission data for hospitals is unavailable to cons
D: Hospital readmissions for heart failure can be reduced by improving care

Which of the following is a heart failure core measure according to the Joint Commission and Centers for Medicare & Medicaid Services?
A: Documentation of a 6 minute walk test
B: Completion of a quality of life assessment
C: Provision of smoking cessation counseling/advice
D: Documentation of beta-blockers prescribed for all patients with heart failure

Q1 Answer: D Q2 Answer: C

ACPE Universal Activity Number: 121-999-11-122 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
INFLUENCE OF A PHARMACIST-INITIATED EDUCATIONAL INTERVENTION ON PATIENTS’ UTILIZATION OF FLUCONAZOLE
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Purpose: With an estimated 13 million cases of yeast infections reported yearly and that number continuously rising, yeast infections are an area of women's health that rightfully needs attention. Three out of 4 women experience at least one bout of vulvovaginal candidiasis (VVC) during their lifetime, therefore making it important to ensure proper education about VVC and proper treatment. The objectives of this study are to determine utilization of fluconazole among patients discharged from an outpatient urgent care setting and whether or not a pharmacist educational intervention improves the proper utilization of fluconazole in self-treatment of VVC.

Methods: Patients will randomly be assigned to either receive OBRA-90 counseling or OBRA-90 counseling plus additional pharmacist education intervention, which will entail reviewing important aspects of VVC and fluconazole. Pre-intervention, all patients will be asked to answer a survey including case-based scenario questions. After 4 weeks, patients will be contacted to retake the same survey and assess utilization of fluconazole and satisfaction of the intervention. Utilization of fluconazole will be stratified as appropriate or inappropriate. Appropriate use will be defined as taking fluconazole for self-reported treatment of VVC. Inappropriate use will be defined as taking fluconazole as prophylactic therapy for VVC. Data will be collected from February 2011- April 2011, pending IRB approval. Objectives will be analyzed using inferential and descriptive statistics.

Results: The two groups will be evaluated for whether pharmacist educational intervention led to increased numbers in the appropriate use arm. Satisfaction of the visit will also be assessed.

Conclusions: Results of this study may enhance pharmacists' knowledge of how patients typically utilize fluconazole and their perceptions of VVC, therefore enabling pharmacists to better tailor their counseling upon patient discharge and provide optimal patient care.

Learning Objectives:
Identify signs and symptoms of vulvovaginal candidiasis.
Review risk factors of vulvovaginal candidiasis.

Self Assessment Questions:
What are signs and symptoms of VVC?
A: Pain upon urination, itchiness, and soreness of the vulva
B: Lower abdominal pain that sometimes extends to the lower back
C: There are no signs and symptoms
D: Appearance of small red bumps or sores

Which of the following is a risk factor for VVC?
A: Being post-menopausal
B: A diagnosis of depression
C: Antibiotic use
D: Being Caucasian

Q1 Answer: A  Q2 Answer: C

ASSESSING PATIENT KNOWLEDGE AND SATISFACTION FROM A COMMUNITY PHARMACIST-LED HYPERTENSION CLASS IN THE GROCERY STORE PHARMACY SETTING
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Purpose: Of the more than 75 million Americans diagnosed with hypertension, only 68% have achieved goal blood pressures. Evidence supports the combination of drug therapy and lifestyle modifications to improve blood pressure control; however, many patients are either undereducated or uneducated about the importance of such factors in lowering morbidity and mortality associated with uncontrolled hypertension. The primary objective of this research is to assess the knowledge patients gain from attending a pharmacist-led hypertension education class. The secondary objectives are to evaluate participant satisfaction and to determine patient characteristics that correlate with knowledge and satisfaction.

Methods: Patient education will be provided through pharmacist-led hypertension classes in three Chicago supermarket pharmacies between January and March 2011. Participants will be recruited through in-store marketing and pharmacy refill histories. Classroom-based content includes general disease information, lifestyle modifications, and medication-taking behaviors based on concepts presented in JNC7 and the AHA, while the remainder of the class is a guided walking tour of the grocery store to further reinforce the role of diet. Participants will complete pre- and post- quizzes on course content to determine the impact of pharmacist-delivered education on knowledge. Patient satisfaction will be measured through the use of a patient satisfaction survey after the class concludes. All patient assessment tools will be completed anonymously. Data analysis will include descriptive and comparative statistics using SPSS software for analysis.

Results: Data collection in progress.

Implications/Conclusions: It is anticipated that this research will further validate the community pharmacists role as a patient educator and demonstrate that community pharmacists can bridge the gap between the care goals that physicians communicate with patients and the steps patients actually implement to achieve these goals.

Learning Objectives:
Describe the impact that hypertension education in the community pharmacy setting has on patient knowledge of lifestyle modifications and medication-taking behaviors.
Discuss participant demographics and how they relate to reported satisfaction with pharmacist-led education.

Self Assessment Questions:
The educational component that demonstrated the greatest improvement in patient knowledge was:
A: Recommended sodium intake per day
B: Identifying factors that affect blood pressure
C: When to take medicines
D: Goal blood pressure levels

Patients completing which level of education reported the highest satisfaction?
A: High school graduate
B: Some college
C: College graduate
D: Graduate school

Q1 Answer: A  Q2 Answer: A
ASSESSMENT OF THE USE OF RECOMBINANT TISSUE PLASMINOGEN ACTIVATOR FOR THE TREATMENT OF ACUTE ISCHEMIC STROKE DURING THE DAY VERSUS NIGHT SHIFT

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PURPOSE: In patients experiencing acute ischemic stroke (AIS), treatment with IV tissue-plasminogen activator (tPA) has been shown to have favorable long-term outcomes. The purpose of this study was to compare treatment methods and patient outcomes of patients arriving to the emergency department (ED) during the day versus night shift.

METHODS: Adult patients from January 2008 to December 2010 with a suspected diagnosis of AIS who presented to the ED within three hours of symptom onset were identified retrospectively using an institution database. Patients were included if they presented with non-resolving symptoms of AIS with a NIHSS score ≥ 4 and onset of symptoms occurred outside of a hospital setting. Patients were stratified into two groups based on time of arrival to the ED. The primary objective was to compare the rates of treatment with IV tPA in eligible patients, day versus night shift. Secondary objectives compared the door-to-needle time, rate of intracranial hemorrhage (ICH), rate of in-hospital mortality, and 3-day change in NIHSS score of patients.

RESULTS: To date, 65 tPA-eligible patients have been included (day, n=38; night, n=27). 84% of patients in the day group received IV tPA; 78% of patients in night group received IV tPA. The average door-to-needle time for the day group was 90 minutes and 93 minutes in the night group. ICH was experienced by 10% of patients in day group and 11% in night group. Day and night shift patients demonstrated 10% and 7% in-hospital mortality, respectively. The mean 3-day change in NIHSS score in the day and night group was -3.4 and -3.3, respectively.

CONCLUSION: Patients presenting to the ED with suspected diagnosis of AIS during the day shift had a similar likelihood to the night shift of receiving treatment with IV tPA.

Learning Objectives:
- Identify the recommended goal treatment times for patients with suspected diagnosis of acute ischemic stroke.
- Describe the potential benefits of treatment with intravenous tissue-plasminogen activator.

Self Assessment Questions:
According to AHA recommendations, patients who receive IV tPA should receive treatment within how many minutes of presedentation to the emergency department?

A: 60
B: 90
C: 120
D: 180

Patients treated with IV tPA have what kind of risk of experiencing an intracranial hemorrhage?

A: No risk
B: Decreased risk
C: Increased risk
D: No association can be determined

Q1 Answer: B  Q2 Answer: C

ACPE Universal Activity Number 121-999-11-295-L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5

ASSESSING BREAST CANCER PATIENT ADHERENCE TO ADJUVANT ENDOCRINE THERAPY THROUGH PHARMACIST INTERVENTIONS VIA MAIL-ORDER SERVICES

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Background: Adjuvant endocrine therapy (AET) reduces the risk of breast cancer recurrence and improves overall survival in the treatment of early stage, hormone receptor + breast cancer. As in other disease states, long term compliance is a major concern. A meta-analysis of trials to assess adherence to endocrine therapy in adjuvant treatment of breast cancer found that 23-28% of participants prematurely discontinued medications. Pharmacist interventions have shown significant improvements in patient adherence to oral therapy. However there is still limited data on the overall impact a pharmacist can make on improving adherence rates in breast cancer patients.

Methods: This study is an IRB approved, prospective, randomized, unblinded, single center study evaluating the effects of pharmacist interventions on adherence rates to AET in women with early stage breast cancer at the Breast Care Center at Froedtert Hospital (FH) Cancer Center.

Patients will be randomized to either the pharmacist intervention arm or standard care arm. Inclusion criteria include women > 18 years with estrogen receptor +, stage I - III, breast cancer receiving AET for > 12 months and eligible to use mail-order pharmacy services. Patients randomized to the pharmacist intervention arm will use FH outpatient mail-order services and receive monthly phone interviews to assess for adverse effects and identify other potential reasons for nonadherence. A retrospective, baseline six month refill history will be obtained on both arms. Every 6 months patients will complete a quality of life and self-reported adherence survey. Adherence rates will be determined by medication refill histories from the mail order pharmacy in the intervention arm and outside pharmacies for the standard of care arm. The primary outcome is adherence rate to AET. Secondary outcomes include identification of predictors to adherence.

Results/Conclusion: Primary and secondary outcomes remain under investigation, with enrollment, data collection and evaluation currently being conducted.

Learning Objectives:
- List 2 commonly reported predictors of nonadherence in breast cancer patients.
- Identify the percent risk reduction of breast cancer recurrence in ER/PR- positive early stage, hormone receptor + breast cancer patients receiving AET for > 12 months.

Self Assessment Questions:
Which of the following statements if true regarding the 2 most commonly listed predictors for nonadherence in breast cancer patients?

A: Multiple positive lymph nodes, social economic status
B: Complex medication regimen, side effects
C: Multiple lymph nodes +, perception of risk
D: Level of education, perception of risk

What percent risk reduction of breast cancer recurrence is reported in the literature for the use of tamoxifen in premenopausal patients there are hormone receptor positive?

A: 40%
B: 90%
C: 15%
D: 75%

Q1 Answer: C  Q2 Answer: A

ACPE Universal Activity Number 121-999-11-335-L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
FROM THE CENTRAL PHARMACY TO THE PATIENT DRAWER - ANALYSIS OF A REDESIGNED FIRST-DOSE MEDICATION DELIVERY SYSTEM

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Purpose:
The purpose of this investigation is to determine if a redesigned delivery process positively impacted the timeliness and accuracy of first-dose medication distribution at the University of Wisconsin Hospital and Clinics (UWHC).

The objectives of this study are to:
(i) Analyze the impact of the change in the first-dose medication delivery system
(ii) Investigate the current first-dose order verification practices used by pharmacists at UWHC
(iii) Compare the number of missing dose requests before and after the implementation of the redesigned medication delivery system
(iv) Evaluate pharmacist, nurse, and pharmacy technician satisfaction with the revised medication delivery system
(v) Educate pharmacists at UWHC about the impact of first-dose time selection on the medication use system

Methods:
Observations of the first-dose medication system have been performed to determine opportunities for system improvement. A comparison of data from the electronic medication record regarding the pharmacist first dose order verification practices pre- and post-change of the first-dose delivery model were analyzed. Specifically, the times between the initial medication order, pharmacist verification time, scheduled dose time, and nursing administration time was evaluated. Also, data regarding missing medication requests sent from nursing handheld barcode scanning devices were analyzed for a one-month period after the change in the medication delivery model. An electronic survey was conducted to assess pharmacist, pharmacy technician, and nursing perceptions regarding the first-dose medication delivery system and missing medication requests before and after the delivery model change. These data will be used to formulate training for pharmacists to optimize dispensing procedures for first-dose medications at UWHC.

Results/Conclusions:
Results and conclusions will be presented at the Great Lakes Residency Conference

Learning Objectives:
Recognize the impact that pharmacist verification practices can have on the timeliness of first-dose medication delivery.
Identify common situations leading to the submission of missing medication requests using the nursing hand-held barcode scanning device.

Self Assessment Questions:
What is one way that a pharmacist could appropriately verify a first-dose medication?
A: A dose that is scheduled for later in the day is dispensed as STAT
B: The manual dispensing step is omitted when a multi-dose item is
C: The first dose is scheduled for approximately two hours after it is v
D: The “do not dispense” option on the medication order is accidental

What time of day are most missing medication requests received and what is the likely cause?
A: 0000 – there are no medication delivery runs at this time
B: 0800 – the majority of scheduled medications are scheduled for 0
C: 1400 – this is around shift change for decentralized pharmacy technici
D: 1800 – most medications that are scheduled with food are given at

Q1 Answer: C Q2 Answer: B

SAFETY OF TARGETED ONCE-DAILY BUSULFAN IN PATIENTS UNDERGOING HEMATOPOIETIC TRANSPLANTATION FOR HEMATOLOGIC MALIGNANCIES: THE IBMT EXPERIENCE

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Purpose: Busulfan is used in myeloablative conditioning regimens for hematopoietic stem cell transplants. The current standard of practice at Indiana Blood and Marrow Transplantation is to dose-adjust busulfan based on AUC due to the large range of inter-patient variability in drug exposure. Many transplant centers take a similar approach to busulfan dosing, however some argue that pharmacokinetic monitoring does not provide any additional benefit in systemic toxicity or patient outcomes. This study aims to compare our practices before and after implementation of targeted daily busulfan dosing to determine if a benefit exists in pharmacokinetic analysis of AUCs.

Methods: This is a retrospective cohort study involving IBMT patients aged 18 and older who received at least one dose of busulfan in preparation for bone marrow or peripheral stem cell transplant from November, 2005 through September 30, 2010. Based on the inclusion criteria; availability of electronic medical records, 73 patients will be included. These patients will be divided into cohorts based on receipt of targeted or non-targeted once-daily intravenous busulfan dosing. Each cohort will contain 39 and 34 patients, respectively. The primary objective is to determine if targeted busulfan dosing reduces toxicity, improves outcomes, and is economically justifiable compared to non-targeted dosing. Primary endpoints include the development of toxicity, including VOD, seizures, secondary malignancy, and liver toxicity defined by diagnosis of the attending physician and validated classification criteria. Secondary endpoints include mortality, effect of multi-organ failure, PAM, PAM-MOS, and occurrence of GvHD and relapse defined by diagnosis of the attending physician and validated criteria; number of hospital days within first 100 days post-transplant; time to neutrophil engraftment; primary graft failure; and comparison of demographics.

Results: Data collection is in progress. Preliminary results will be presented at the Great Lakes Resident Conference.

Learning Objectives:
List three reasons why many transplant centers may elect to use AUC-targeted dosing of busulfan.
Describe the controversy regarding AUC-targeted dose adjustment of busulfan for use in myeloablative preparatory regimens.

Self Assessment Questions:
Why do transplant centers utilize AUC-targeted dosing of busulfan in myeloablative preparatory regimens?
A: To reduce incidence of veno-occlusive disease
B: To increase incidence of primary graft failure
C: To attenuate the development of graft-vs-cancer response
D: To maximize total drug exposure

What is the major argument against using AUC-targeted busulfan dosing in myeloablative preparatory regimens?
A: AUC-targeted dosing is extremely expensive
B: AUCs are predictable with the intravenous formulation
C: Targeted dosing may not reduce the development of toxicity
D: Drawing levels for AUC analysis is time-consuming

Q1 Answer: A Q2 Answer: C

ACPE Universal Activity Number: 121-999-11-190 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
IMPLEMENTATION OF AN ALCOHOL WITHDRAWAL ASSESSMENT AND MANAGEMENT PROTOCOL AT AN ACADEMIC MEDICAL CENTER
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Purpose:
Alcohol misuse is a growing health care problem in the United States. A standardized medication management plan for patients suffering from alcohol withdrawal syndrome (AWS) does not currently exist at Wishard Health Services (WHS), a 350 bed safety-net hospital in Indianapolis, Indiana. The purpose of this project is to implement an alcohol withdrawal assessment and management protocol for use in the emergency department and inpatient settings at WHS.

Methods:
This study is a retrospective, observational chart review of patients initiated on an abbreviated Clinical Institute Withdrawal Assessment (CIWA-Ar) based alcohol withdrawal assessment and management protocol from January 2011 to May 2011. Physicians choose among three treatment algorithms based on patient-specific factors. Patients are included if they are age 18 or older and receive the protocol for documented or suspected AWS. Exclusion criteria include pregnant patients and prisoners. Electronic databases and paper charts are utilized to gather patient data and identify patients initiated on the protocol. The primary outcome for this study is the percentage of patients experiencing delirium tremens compared between patients managed with or without the protocol.

Preliminary Results:
A pilot of the alcohol withdrawal management and assessment protocol is taking place on the telemetry patient care unit and one medical/surgical patient care unit. Formal results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Classify the severity of alcohol withdrawal syndrome in a patient using the CIWA-Ar assessment scale and identify patients who would benefit from medication management.
Describe pharmacologic treatment options and treatment algorithms for the management of alcohol withdrawal syndrome.

Self Assessment Questions:
Which of the following CIWA-Ar scores would correlate with a need for medication management with lorazepam?
A: > 2
B: > 4
C: > 6
D: > 8
Which of the following patients would benefit the most from symptom triggered lorazepam medication management?
A: A 30 year old male who claims to drink 1 pint of vodka daily and presents with a heart rate of 120
B: A 27 year old female who drinks socially on the weekends and presents with a heart rate of 100
C: A 48 year old male who has been admitted to the hospital multiple times for alcohol withdrawal
D: A 35 year old female who was treated in the ICU last month for DT
Q1 Answer: D Q2 Answer: A

IMPLEMENTATION AND EVALUATION OF AN ELECTRONIC MEDICATION USE PROCESS WITHIN AN AMBULATORY CLINIC
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Purpose: The University of Wisconsin Hospital and Clinics (UWHC) first introduced an electronic medical record (EMR) in April 2008. Within many of the ambulatory clinic areas and infusion center, the current process for ordering and dispensing medications required during a specific patient visit is managed on paper. The purpose of this project is to coordinate the implementation, evaluate, and improve the medication use process using an EMR within an ambulatory clinic at UWHC.

Methods: Using the UWHC transplant clinic as a pilot site, the current medication use workflows were documented using direct observation. All medication orders that are administered within the clinic were collected and built into treatment plans if appropriate. To measure the impact of the electronic medication use system, medication data was collected from patient charts twenty-five days pre and post implementation. Metrics include the number/percentage of paper orders, the number/percentage of orders reviewed by a pharmacist, the number/percentage or orders intervened by a pharmacist, the number of medication returns, and the number of incomplete, missing, and incorrect documentation of medication orders and administrations. Patient safety reports and Medicare patient medication write-offs will be evaluated four months before and after implementation.

Results: The percent of electronic orders documented in the medical record increased from 30.9% to 99.7% after implementation. The percent of orders reviewed by a pharmacist were higher post implementation (38.2% vs 97.1%). The number of clinical interventions performed by pharmacists remained unchanged pre and post implementation (2 vs 2). Order documentation errors decreased from 54% to 7%, and administration documentation errors decreased from 35% to 17% as a result of using the electronic system. Additional results are in the process of being collected.

Conclusion: Information from this project will provide a framework for the future implementation of electronic ordering for in-clinic medication administration across all UWHC clinics.

Learning Objectives:
Explain the project management activities involved with implementing an electronic medication use system.
Describe the outcome of utilizing an electronic process to order medications, verify orders, and document administration of medications in an electronic medical record versus a paper system.

Self Assessment Questions:
Which factor was the most significant issue prior to fully implementing an electronic medical record in this study?
A: Approval of evidence-based treatment plans and ordersets
B: Clinician scope of practice and use of delegation protocols
C: Technical design of the medication administration record
D: Training of all end-users
Which metric(s) improved as a result of electronic ordering and verification of all clinic administered medications in this study?
A: Pharmacist Interventions
B: Documentation of route
C: Documentation of dose
D: Both B and C
Q1 Answer: B Q2 Answer: D

ACPE Universal Activity Number 121-999-11-380-P
Activity Type: Knowledge-based Contact Hours: 0.5

ACPE Universal Activity Number 121-999-11-061-P
Activity Type: Knowledge-based Contact Hours: 0.5
EFFECT OF HOME BETA-BLOCKER USE IN PATIENTS PRESENTING WITH SUBARACHNOID HEMORRHAGE
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Introduction: Aneurysmal subarachnoid hemorrhage (aSAH) is a significant cause of morbidity and mortality. Neurocardiogenic injury also known as myocardial stunning is a complication of aSAH that develops in a significant proportion of patients. Objective: This study evaluated if patients on a beta-blocker prior to admission are at less risk for myocardial stunning than those patients not on a beta-blocker. Methods: A retrospective chart review was conducted in patients admitted for aSAH. Cardiovascular risk factors, admitting vital signs, development of cardiogenic injury and home medication list were recorded. The primary outcome was a combined endpoint of cardiovascular dysfunction within 24 hours of admission defined as new LV dysfunction (EF <45% by ECHO), presence of pulmonary edema on Chest X-ray or presence of abnormal troponin. Secondary outcomes included any new onset arrhythmia, time in hours until troponin less than 0.02 ng/mL, peak troponin value, length of stay, and disposition on discharge. The data will be analyzed in SPSS Version 16.0. Chi-square or Fishers exact test will be used for dichotomous variables. Student t-test or Mann-Whitney U test will be used for continuous variables.

Results: Data collection ongoing.

Conclusion: Pending results.

Learning Objectives:
Describe the etiology of myocardial stunning in aneurysmal subarachnoid hemorrhage.

Self Assessment Questions:
The most specific marker for neurocardiogenic injury is:
A: Elevated troponin
B: Elevated Blood Pressure
C: Elevated CK
D: Pulmonary Edema

Beta-blockers may prevent neurocardiogenic injury by:
A: Catecholamine blockade
B: Decreasing blood pressure
C: Preventing ventricular re-modeling
D: Suppressing Arrhythmias

Q1 Answer: A  Q2 Answer: A

ACPE Universal Activity Number 121-999-11-313 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

EVALUATION OF GLYCEMIC CONTROL IN HOSPITALIZED PATIENTS WITH DIABETES IN A COMMUNITY HOSPITAL SETTING
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Purpose:
The goal of this study is to evaluate glycemic control of diabetic patients who are hospitalized by comparing patients treated with basal-bolus insulin therapy versus traditional insulin therapy.

Methods:
This research study was submitted to the St. Elizabeth Healthcare Institutional Review Board and has been granted an exempt status. This is a retrospective chart review of patients who were admitted to all units of a community hospital, except intensive care unit, over two 8 week time periods. Patients are included if they have a diagnosis of diabetes and require subcutaneous insulin therapy to manage their blood glucose. Study groups are patients treated prior to staff education on basal-bolus insulin therapy protocol versus patients treated post staff education on basal-bolus insulin therapy protocol. Education will be provided to clerical staff, nursing staff and physicians on the pre-approved basal-bolus protocol. Primary outcome of the study will evaluate glycemic control in hospitalized patients with diabetes by looking at the percent of time patients are within target blood glucose range and comparing what percent of patients on basal-bolus therapy are within the targeted range versus traditional insulin therapy. Secondary outcomes: percent of BG readings < 70 mg/dl, percent of readings >180 mg/dl, number of interventions made for hypoglycemic episodes, mean blood glucose, and the number of patients receiving a hemoglobin A1c ordered during their stay.

Results and Conclusions:
Research is currently in the data collection phase. Results and conclusion will be presented at the Great Lakes Residency Conference.

Learning Objectives:
Review the current recommendations for hospitalized patients glycemic control including target blood glucose levels and medication regimens. Discuss the effects of uncontrolled blood glucose on hospitalized patients.

Self Assessment Questions:
What is the current ADA and AACE recommendation for target fasting blood glucose levels for hospitalized, non-critically ill patients?
A: <100 mg/dl
B: <120 mg/dl
C: <140 mg/dl
D: <180 mg/dl

What is the recommended medication therapy to achieve glycemic control in non-critically ill hospitalized patients?
A: Oral antihyperglycemic agents
B: Sliding scale insulin therapy alone
C: Intravenous insulin therapy
D: Basal-bolus insulin therapy

Q1 Answer: C  Q2 Answer: D

ACPE Universal Activity Number 121-999-11-270 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
STRUCTURED PHARMACIST DISCHARGE COUNSELING IN HEART FAILURE PATIENTS

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Purpose:
National, 18% of admissions for heart failure result in readmission within 30 days. These readmissions represent a reduced disease free period for patients as well as increased financial burden on the healthcare system. Because management of heart failure consists mainly of medications and diet control, there is tremendous potential for pharmacist influence in preventing readmission. The purpose of our study was to examine the impact of structured pharmacist discharge counseling and medication reconciliation on the rates of readmission among heart failure patients. In addition we sought to characterize the inpatient management of heart failure patients admitted for exacerbation within our institution.

Methods:
Patients admitted with a diagnosis of heart failure exacerbation to three predetermined inpatient services received counseling and a reconciliation of medications by a pharmacist prior to discharge. The counseling method entitled "PHARM" consisted of a standardize session which included a discussion of basic heart failure pathophysiology, symptoms of exacerbation, life style modifications, and medication uses and compliance. After discharge the number of ER visits and readmission rates within 30 days for counseled patients will be compared to those of patients on units where pharmacists were not counseling. Additional information gathered to describe exacerbation management included the name, dose, and route of heart failure medications the patient was prescribed prior to admission, while inpatient, and at discharge as well as BNP laboratory measures, weights at admission and discharge, and patient ventricular ejection fractions.

Results/Conclusions: Data assessment is still currently in progress. Study conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Describe lifestyle modifications required for patients with heart failure.

Self Assessment Questions:
In the United States what percentage of patients with heart failure will be re-admitted within 30 days of discharge?
A 90.9%
B 40.2%
C 1.5%
D 18.6%

Patients with heart failure should make which of the following lifestyle modifications?
A Increase their water intake and decrease salt in their diet.
B Decrease water intake and decrease salt in their diet.
C Decrease their water intake and increase salt in their diet.
D Increase their water intake and increase salt in their diet.

Q1 Answer: D Q2 Answer: B

EVALUATION OF A GROUP TOBACCO CESSATION CLINIC TARGETED TO WOMEN SMOKERS

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Background/Purpose:
According to Tobacco Use and Dependence Guidelines from the U.S. Public Health Service there is a need for studies of tobacco cessation programs that are targeted to one gender. In Fall 2010 the tobacco cessation clinic at the William S Middleton Memorial Veterans Hospital began planning a clinic targeted to women smokers. The first group to participate in this clinic started mid November 2010 and will finish mid February 2011. The purpose of this project is to evaluate the efficacy of this new group clinic. Results of this evaluation will be used to improve the clinic for future women that wish to quit smoking.

Methods:
All women veterans who smoke were mailed a flyer inviting them to join the new tobacco cessation group clinic. Additionally, women veterans were recruited directly by health care providers during hospital/clinic visits. The format of the class was the same as the ongoing coed group tobacco cessation class. Patients attended group classes for four consecutive weeks. This was followed by two telephone calls, one at week 6 and the second at week 12. There was a total of 3 months of provider contact per patient. Data collected included demographic information, tobacco cessation medications prescribed (medication, dose, duration), success of quit attempt, method of referral or recruitment to the womens tobacco cessation group clinic and whether the women completed the full 12 week program. Upon evaluation, the primary outcome will be tobacco cessation rates. In addition, patient specific factors affecting quit attempts will also be examined.

Results/Conclusion:
The results and conclusion are pending.

Learning Objectives:
Recognize the benefits of a targeted tobacco cessation group clinic.
Discuss the methods of implementing and evaluating a targeted tobacco cessation group clinic.

Self Assessment Questions:
Compared to men, women attempting to quit smoking are:
A less likely to benefit from the use of bupropion
B more likely to benefit from socialization of a peer group
C less likely to benefit from education on weight gain
D more likely to benefit from nicotine replacement therapy

When evaluating a new tobacco cessation clinic it is important to:
A consider patient feedback
B disregard patient enrollment methods
C examine patient quit rate
D both A and C are correct

Q1 Answer: B Q2 Answer: D

ACPE Universal Activity Number 121-999-11-341 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
Purpose: In the United States, 13 percent of the population is comprised of those 65 years and older. However, this population consumes nearly one-third of all medications prescribed. As patients age, the likelihood of inappropriate prescribing increases and screening tools have been created to identify these PIMs, including the STOPP criteria (Screening Tool of Older Persons potentially inappropriate Prescriptions). Despite the use of screening tools, 20-30% of elderly patients are taking PIMs, but studies show that profile reviews by community pharmacists screening for PIMs have reduced the number of potential drug-related problems and improved appropriate prescribing. The purpose of this study is to determine whether the implementation of a pharmacist-conducted screening tool with decision support alerts to identify PIMs at UW Health pharmacies: 1) increases the identification of PIMs; 2) reduces the number of PIMs dispensed; 3) leads to an increase in pharmaceutical care interventions and compensation.

Methods: A retrospective review of prescription data was conducted to identify inappropriate medications from the STOPP criteria prescribed most frequently. Decision support alerts were developed based on currently accepted guidelines for these medications to assist pharmacists in determining the appropriate intervention and alternative medications to recommend. To address these alerts pharmacists reviewed medication profiles and electronic medical records, contacted the appropriate prescriber with recommendations, documented the outcome of the intervention (i.e. accepted, rejected, modified) in the pharmacy computer system, and completed pharmaceutical care billing if applicable.

Preliminary results/conclusions: The top 15 medications have been identified from a retrospective review of one month of prescription data at all UW Health pharmacies: 1) increases the identification of PIMs; 2) reduces the number of PIMs dispensed; 3) leads to an increase in pharmaceutical care interventions and compensation.

Learning Objectives:
Describe the impact of PIM prescribing among patients 65 years and older.
Recognize the differences between the Beers criteria and the STOOPP/START criteria available to identify inappropriate prescribing.

Self Assessment Questions:
1) Approximately what percentage of elderly patients are taking PIMs, despite the use of screening tools, such as the Beers or STOPP/START criteria?
- A: 1-10%
- B: 40-50%
- C: 20-30%
- D: 80-90%
The STOPP/START criteria differ from the Beers criteria in the following ways, except?
- A: The use of an expert consensus panel to develop the criteria
- B: The inclusion of errors of omission or medications likely to provide
- C: The arrangement of inappropriate medications by physiological systems
- D: It was developed by European geriatricians

Q1 Answer: C
Q2 Answer: A

THE IMPACT OF GENERIC SUBSTITUTION OF ANTIPILEPTIC DRUGS ON ACUTE EVENTS IN PATIENTS WITH EPILEPSY
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Purpose: To compare the rate of acute events (hospital admissions/ED visits) in subjects with a brand to generic switch to those maintained on brand AEDs.

Methods: This study has been approved by the Institutional Review Board and the Research and Development Committee at Lexington Veterans Affairs Medical Center. Eligible subjects will be identified from Lexington VA Medical Center (VAMC) or Mountain Home VAMC with an ICD-9 code for epilepsy (excluding status epilepticus 345.3) for any encounter. Subjects will have been dispensed topiramate or lamotrigine for epilepsy during the study period and have a medication possession ratio greater than or equal to 0.8. The Veterans Integrated Service Network (VISN) 9 data warehouse will be used to identify subjects. There will be two groups. Subjects with epilepsy at the Mountain Home VAMC were switched from brand to generic. These subjects will also be assessed for multiple generic switches using NDC codes. Subjects with epilepsy at the Lexington VAMC will serve as the control group as they were not switched from brand to generic. Data to be collected includes the following: age at end of study, race, urban/rural, epilepsy diagnosis (including status epilepticus), number of EEGs, other AEDs the patient is on during the study period, care in ER or inpatient hospital with a primary epilepsy diagnosis, number of neurology visits, number of generic switches, medication possession ratio, and an acute event within 6 months prior to the study period. Demographic information will be compared between two groups using either a Student's t-test, chi-square test or Wilcoxon Rank Sum test as appropriate. Cox proportional hazard regression will be used to model the time to an acute event between subjects who had a brand to generic switch and subjects who remained on brand AEDs adjusting for demographics and other covariates.

Learning Objectives:
Define bioequivalence.
Describe the controversy of using generic antiepileptic medications.

Self Assessment Questions:
The Food and Drug Administration rates generics demonstrating bioequivalence as
A: AA
B: AB
C: AC
D: AD

What are some possible clinical implications of using multiple generic antiepileptic medications?
A: Financial burden
B: Family strain
C: There are none
D: A and B

Q1 Answer: B  Q2 Answer: D

ACPE Universal Activity Number 121-999-11-229 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
EVALUATION OF ADHERENCE TO SUGGESTED LABORATORY MONITORING PARAMETERS IN VETERANS TREATED WITH ATYPICAL ANTI精神病ICS IN MENTAL HEALTH AND NON-MENTAL HEALTH SETTINGS

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Background/Purpose:
In 2004, the American Diabetes Association (ADA) published a consensus statement on atypical antipsychotics and obesity and diabetes. This statement was developed to address the evidence associating atypicals with metabolic complications and to provide guidance for appropriate baseline screening and ongoing monitoring that should be conducted in patients receiving these agents. The purpose of this study is to evaluate the proportion of patients prescribed atypical antipsychotics that are appropriately monitored according to the ADAs consensus statement among mental health and non-mental health patients at Edward Hines Jr., VA Hospital.

Methods:
All patients > 65 who received a new prescription for an atypical antipsychotic between May 1, 2007 and March 31, 2010 and who did not receive an atypical within 12 weeks prior to the initiation of the new atypical will be included in the study. Eligible patients will be classified as a mental health or non-mental health patient based the presence or absence of psychiatry management during the study period. It is anticipated that 130 patients will be enrolled in the study. Charts will be reviewed for demographics, atypical antipsychotic use, and the following monitoring parameters: fasting plasma glucose (FPG), fasting lipid panel (FLP), weight, and BP. Changes in antipsychotic treatment, lipid lowering agents and hypoglycemic medications will also be assessed. One year of data following antipsychotic initiation will be reviewed. The primary endpoint will be a composite outcome of compliance with FPG and FLP monitoring. A patient will be considered appropriately monitored if there are results for FPG at baseline, 12 weeks, and 12 months and FLP at baseline and 12 weeks. The proportion of patients that are appropriately monitored will be compared between patients followed by a mental health provider versus those without mental health follow up.

Results/Conclusions:
To be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Identify the 6 parameters that compose the ADA recommended monitoring protocol for patients receiving atypical antipsychotics.
Outline the timeframe for how frequently assessments should be made with regards to these parameters.

Self Assessment Questions:
Which of the following is an ADA recommended monitoring parameter for patients prescribed atypical antipsychotics?
A: Height
B: Fasting lipid panel
C: Thyroid function test
D: Heart rate

According to the ADA consensus statement, how often should fasting plasma glucose be assessed in patients receiving atypical antipsychotics?
A: Baseline
B: Baseline, 4 weeks, quarterly
C: Baseline, 12 weeks, annually
D: Baseline, annually

Q1 Answer: B Q2 Answer: C

USE OF AMINOCAPROIC ACID IN TRAUMA PATIENTS WITH SIGNIFICANT HEMORRHAGE

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USE OF AMINOCAPROIC ACID IN TRAUMA PATIENTS WITH SIGNIFICANT HEMORRHAGE

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BACKGROUND: Traumatic injury is the leading cause of mortality in people under the age of 45. Hemorrhagic shock appears to be one of the leading causes of mortality resulting from trauma. Increased fibrinolysis contributes significantly to coagulopathy resulting from both surgery and trauma, explaining the potential benefit of antifibrinolytics to reduce blood loss from trauma. Recently, the CRASH-2 study demonstrated a statistically significant mortality benefit with the use of tranexamic acid in patients with severe traumatic hemorrhage. The question remains of whether results can be duplicated with other antifibrinolytic agents. The purpose of this study is to evaluate the efficacy of aminocaproic acid in trauma patients with significant hemorrhage.

METHODS: This is a retrospective case-control study evaluating the efficacy of aminocaproic acid in patients with significant hemorrhage requiring massive transfusion over the years 2005 to 2010. Patients meeting the following criteria will be included: present to Methodist Hospital or Wishard Hospital within 8 hours of initial injury, at least 18 years of age, admitted with the diagnosis of trauma, and required at least 10 units of packed red blood cells within the first 24 hours after admission. Primary outcome will be a difference in all-cause mortality at post-injury day 28 between patients receiving aminocaproic acid vs. those not receiving aminocaproic acid. Secondary outcomes will include quality of blood products received, length of hospitalization, length of intensive care unit stay, and the presence of adverse effects related to aminocaproic acid.

RESULTS: Results and conclusions of this study will be presented at the Great Lakes Residency Conference.

Learning Objectives:
Describe the mechanism in which fibrinolytic agents could potentially decrease bleeding in trauma patients.
Explain the results of the CRASH-2 study.

Self Assessment Questions:
Antifibrinolytic agents have the potential to decrease bleeding by...
A: providing exogenous fibrin, which can be used to increase clotting
B: promoting lysis of fibrin clots to decrease bleeding.
C: providing additional clotting factors to assist with clotting and decrease bleeding.
D: reversing fibrin clot lysis and decrease bleeding.

The CRASH-2 study, evaluating efficacy of tranexamic acid in patients with severe hemorrhage, found the following results:
A: Increased bleeding with the use of tranexamic acid compared to placebo
B: Statistically significant decrease in amount of blood products given
C: Statistically significant decrease in all cause mortality in patients receiving tranexamic acid
D: Statistically significant increase in clotting seen in patient receiving tranexamic acid

Q1 Answer: D Q2 Answer: C

ACPE Universal Activity Number 121-999-11-281-L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
PERIOPERATIVE MANAGEMENT OF ANTICOAGULATION THERAPY: A RETROSPECTIVE REVIEW

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Background: A common clinical issue arises when chronic warfarin therapy must be interrupted for a surgical or invasive procedure. It takes several days for the anticoagulant effect of warfarin to reverse. To minimize the time that the patient is off of anticoagulation, patients can be bridged with shorter-acting injectable anticoagulants. No agent is FDA approved for anticoagulation bridging, but clinicians often utilize guidelines last updated by the American College of Chest Physicians (ACCP) in 2008. Louis Stokes Cleveland Veterans Affairs Medical Center (LSCVAMC) has implemented an anticoagulation bridging protocol largely based on the ACC guidelines. One difference is the use of fondaparinux, since the guidelines do not discuss factor Xa inhibitors for anticoagulation bridging.

Objectives: To assess the incidence of thromboembolic and hemorrhagic complications associated with perioperative anticoagulation bridging protocol at LSCVAMC. Secondary objective is to assess adherence to the anticoagulation bridging protocol in place at the facility.

Methodology: A retrospective chart review will evaluate patients with an Anticoagulation Bridging Consult entered into the computerized patient record system for LSCVAMC. Subjects must be on chronic warfarin therapy monitored by the Anticoagulation Clinic (ACC) and require temporary interruption of warfarin for one scheduled procedure. They will be excluded if the procedure was performed at an outside facility, or if switched from an injectable anticoagulant to a heparin infusion for ≥24 hours. Patients will be followed until achieving a therapeutic INR after reinitiating warfarin. The ACC prescribes injectable anticoagulants based on patient-specific thromboembolic risk stratification. The primary endpoints of major bleeding, minor bleeding, and thromboembolism will be reported overall and within subgroups. Major bleeding will be defined using criteria published by the International Society on Thrombosis and Hemostasis. Procedures will be stratified by surgical bleeding risk. Desired sample size is 170 patients from July 2008-2010. Descriptive statistics will be reported.

Learning Objectives:
Select an appropriate perioperative anticoagulation bridging strategy, taking into account the bleeding risk of the procedure and the thromboembolic risk of the patient.
Define examples of surgical procedures associated with high and low 2-day risk of major bleeding.

Self Assessment Questions:
What would be an appropriate perioperative bridging strategy for a 78 year old patient on chronic warfarin therapy for atrial fibrillation, who has hypertension, diabetes, and a history of stroke?

A: Dalteparin 5,000 international units subcutaneously every 24 hours
B: Enoxaparin 1mg/kg subcutaneously every 12 hours
C: Fondaparinux 2.5mg subcutaneously every 24 hours
D: No anticoagulation bridging is necessary

Which of the following procedures is associated with a high surgical bleeding risk?

A: Skin cancer excision
B: Gastrointestinal endoscopy
C: Polypectomy
D: Cataract removal

EVALUATION OF MEDICATIONS USED PRIOR TO INTUBATION IN THE NEONATAL INTENSIVE CARE UNIT

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Purpose: The American Academy of Pediatrics recommends that every health care facility caring for neonates implement an effective pain-prevention program for use during neonatal procedures. In reviewing pharmacologic therapies used prior to intubation in neonates, a variety exists in the types of agents used for premedication. The objective of this study is to evaluate the safety and efficacy of fentanyl, midazolam, and morphine compared to no premedication when administered immediately prior to intubation.

Methods: Institutional Review Board approval was obtained prior to beginning research. Data was collected for neonates who were intubated between January 2008 and July 2010 if they received fentanyl, midazolam, morphine or no medication immediately prior to intubation. Safety was evaluated by observing the change in the neonates blood pressure, heart rate and oxygen saturation after intubation. Efficacy was evaluated by assessing the number of attempts at intubation and the changes in score from the Neonatal Pain, Agitation and Sedation Scale before and after intubation. When the information was documented, complications encountered during the intubation process were also recorded. Data collected did not include patient identifiers and was kept confidential. Neonates who were intubated in the operating room immediately after delivery were excluded as these are emergency situations that did not allow time for the administration of medication.

Results/Conclusion: Data collection is still in progress. Final results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
List complications that may occur when a neonate is not medicated prior to intubation.
Identify medications that are recommended for use in neonates prior to intubation.

Self Assessment Questions:
When a neonate is not premedicated prior to intubation, which of the following complications has a higher risk of occurring?

A: Increased intracranial pressure
B: Decreased temperature
C: Increased risk of infection
D: Decreased urine output

According to a review from the American Academy of Pediatrics, what type of medication should ALWAYS be given in nonemergent intubation of neonates?

A: Sedatives
B: Muscle relaxants
C: Analgesics
D: Anticholinergics

Q1 Answer: A  Q2 Answer: C

ACPE Universal Activity Number 121-999-11-410-L04-P
Activity Type: Knowledge-based  Contact Hours: 0.5
PURPOSE: Osteoporosis is the most common bone disease, characterized by low bone mass and microarchitectural deterioration which leads to increased risk for fracture. Osteoporosis is a silent disease, but methods to screen, diagnose, and treat osteoporosis before a fracture occurs have been developed. However, many men and women from high risk groups are not evaluated for fracture risk and thus not considered for treatment. FRAX is a fracture risk assessment tool used to estimate the 10-year probability of a hip fracture or major osteoporotic fracture. This tool can provide guidance in making the decision to treat or not to treat. This study will use FRAX to determine what proportion of veterans at the Madison VA currently meet the FRAX recommended threshold for treatment consideration.

METHODS: This is a retrospective chart review identifying male veterans at least 70 years of age or women at least 65 years of age, who qualify for osteoporosis treatment based on the FRAX algorithm. The primary endpoint will be the proportion meeting the FRAX threshold for osteoporosis treatment (>20% risk of major osteoporotic fracture or >3% risk of hip fracture, over ten years). The secondary endpoint will determine the proportion of those meeting treatment threshold who are receiving osteoporosis therapy. The primary and secondary outcomes will be determined as proportions, using the large sample approximation for binomial variables. Appropriate data will be collected to utilize the FRAX tool including: age, gender, height, body weight, previous fracture hip fracture of parent, current smoker, glucocorticoid use, rheumatoid arthritis diagnosis, secondary osteoporosis, alcohol use, and BMD of femoral neck as available. The appropriate laboratory values and medications used for the treatment of osteoporosis will also be recorded.

RESULTS/CONCLUSION:
Results and conclusions are pending and will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
List the risk factors for osteoporosis used in the fracture risk assessment tool (FRAX) to calculate the 10-year probability of a hip fracture or major osteoporotic fracture.
Identify the FRAX threshold for osteoporosis treatment based on the probability of major osteoporotic or hip fracture over ten years.

Self Assessment Questions:
Which of the following is needed to calculate a FRAX score?
A: Age
B: Vitamin D level
C: Calcium level
D: Daily caffeine intake

Osteoporosis is clinically defined by a bone mineral density (BMD) at the hip or spine that is __________ standard deviations away from the young mean reference population.
A: 2.0
B: 3.0
C: 2.5
D: 1.0

Q1 Answer: A  Q2 Answer: C

EVALUATION OF EMERGENCY DEPARTMENT MEDICATION USE: IS THERE AN OPPORTUNITY FOR PROSPECTIVE PHARMACY REVIEW BEFORE MEDICATION ADMINISTRATION?

Purpose: Given the urgent nature of patient care needs in the Emergency Department (ED), establish if prospective pharmacy review before medication retrieval from an Automated Dispensing Cabinet (ADC) may enhance patient safety without delaying medication administration. Determine the time necessary to review and verify medication orders for the ED and determine whether pharmacy staff can verify orders before they are retrieved from the ADC.

Methods: An audit was conducted in the Nationwide Childrens Hospital ED using retrospective data from patient electronic medical records and ADCs. Medication orders from two 24-hour time periods, one from a week day and one from a weekend day were reviewed. Data collection included medication ordered, verification time, time from prescribing to ADC retrieval, and time from ADC retrieval to medication administration. In order to develop a verification control, data from the same two time periods were utilized from other critical care units (NICU and PICU) using the profile mechanism in ADCs. Data were entered into Microsoft Excel spreadsheet to allow for descriptive statistical analysis.

Results: The mean pharmacy verification time for the control medication group was 8.5 minutes and the mean pharmacy verification time for ED medication orders was 3.5 minutes. Overall, 42.5% of ED orders fell within the time period of other critical care units between verification time to when medication was pulled from ADC. Also, 55% of medications in ED would qualify to be on override function leaving approximately 44% of ED verification to drug administration was 103.6 minutes on the week day and 33.4 minutes on the weekend day.

Conclusions: Data suggest that there is an opportunity for pharmacist involvement in the medication use process in the ED.

Learning Objectives:
Identify the benefits of prospective pharmacy review before medication retrieval from an Automated Dispensing Cabinet (ADC).
Describe the challenges of profiling Automated Dispensing Cabinets (ADCs) in the Emergency Department (ED).

Self Assessment Questions:
Which of the following are advantages of prospective pharmacist verification prior to medication administration?
A: Identifying potential medication errors
B: Evaluating patient allergies
C: Optimizing medication therapy
D: All of the above

What are the challenges of profiling Automated Dispensing Cabinets (ADCs) in the Emergency Department (ED)?
A: Resistance from ED staff
B: Development of appropriate medication override list
C: Customization of pharmacy technologies
D: All of the above

Q1 Answer: D  Q2 Answer: D

ACPE Universal Activity Number 121-999-11-479 -L05-P
Activity Type: Knowledge-based  Contact Hours: 0.5
USE OF LEARNING MODULES FOR STUDENT LEARNING ON AN ADVANCED PHARMACY PRACTICE EXPERIENCE

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Web-based learning modules have been used to supplement student learning in the classroom. Utilizing technology to deliver information actively engages learners and allows access to the material in an interactive format. In theory, web-based module design can be applied to an experiential experience such as an advanced pharmacy practice experience (APPE) to enhance student learning. The purpose of this study was to evaluate the use of learning modules for an inpatient general medicine APPE. This is a single-center, interventional study assessing the impact of web-based learning modules on an inpatient general medicine APPE. Study participants were pharmacy students enrolled in a general medicine APPE from February 1 to April 30, 2011. Three web-based learning modules, approximately 1 hour in length, were uniquely designed with Microsoft PowerPoint and recorded with oral narration via Panopto software. Students accessed the modules and assessments online prior to and during the first week of the rotation. Module one reviewed inpatient treatment strategies, goals, and monitoring for diabetes and anticoagulation. Module two reviewed acute renal failure, end-stage renal disease, and drug dosing in dialysis. Module three reviewed antibiotics and institution-specific antibiotic dosing. The primary outcome is the effectiveness of the learning modules on enhancement of student learning. Student learning is defined as knowledge gained concerning inpatient treatment strategies and goals specific to the institution. This endpoint will be assessed via student pre- and post-module computer-based assessments. The secondary outcome of the study is feasibility and impact of the modules on learning assessed by both students and preceptors. Perception of feasibility and impact will be measured by preceptor and student survey responses. Results will be reported with descriptive statistics and student t-test.

Learning Objectives:
Identify topics that can enhance student learning while on an advanced pharmacy practice experience when delivered by web-based learning modules.
Discuss student and preceptor perceptions of the impact of web-based learning modules on learning.

Self Assessment Questions:
Which of the following topics is best suited for review with a web-based learning module for a General Medicine APPE?
A: Fluid and electrolytes
B: Total Parenteral Nutrition
C: Type 2 diabetes mellitus management
D: Acid and Base Disorders

What is a potential advantage of completing a web-based learning module prior to an advanced pharmacy practice experience?
A: Less prepared for the experience
B: Strengthen core pharmacotherapy concepts
C: Preceptors must spend more time with students conducting topic c
D: Lack of utilization of technology

Q1 Answer: C Q2 Answer: B

ACPE Universal Activity Number 121-999-11-442 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5

IMPLEMENTATION OF A PHARMACIST IN AN INTERDISCIPLINARY STROKE SERVICE TELEPHONE FOLLOW-UP PROGRAM AT AN ACADEMIC MEDICAL CENTER

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Purpose: Pharmacists, physicians and nurses at University of Wisconsin Hospital and Clinics (UWHC) Comprehensive Stroke Program work together at discharge to educate patients on strategies to modify risk factors, recognize signs and symptoms of stroke, and manage new medications. With literature suggesting increased outpatient non-adherence to stroke prevention medications there is an evident need to reiterate the importance of compliance with the patient. To avoid unwarranted costs and morbidities associated with medication non-adherence and improve regulatory compliance, a pharmacist will be integrated within the interdisciplinary telephone follow-up program designed for patients recently discharged from the UWHC Comprehensive Stroke Program. The project goal is to improve continuity of patient care from hospital to home by re-educating patients about pharmacologic and non-pharmacologic aspects of stroke prevention. In contributing to this interdisciplinary service, pharmacists have the opportunity to improve patient safety and cost-savings, increase regulatory compliance and expand pharmacists role in continuity of care.

Methods: The resident met with key stakeholders, including the Medical Director and Program Coordinator of the UWHC Comprehensive Stroke Program, the Neurology Pharmacist Team and the Clinical Quality and Regulatory Committee for Stroke, to develop a project plan for the implementation of a telephone follow-up program. The Program Coordinator and resident established consensus on the interdisciplinary workflow of the program; patient inclusion and exclusion criteria and documentation procedures. A progress note template was developed in the electronic health record to document telephone encounters and track regulatory compliance, cost avoidance and pharmacists interventions over time. Before participating in the call back program, pharmacists are required to pass a competency designed by the resident to establish necessary clinical and technological skills. Upon program initiation pharmacists will perform medication reconciliation, reinforce patient understanding of drug therapy and identify potential barriers to adherence.

Results: Conclusion will be presented at the Great Lakes Conference.

Learning Objectives:
Describe how implementing a pharmacist into an interdisciplinary follow-up service can enhance a patient's continuity of care.
Outline the process of establishing a pharmacists position in a new interdisciplinary service.

Self Assessment Questions:
Applying an interdisciplinary approach to improving continuity of care will
A: Improve the patient's understanding of their treatment plan by correlating
B: Promote adherence and cost-effective use of medications
C: Increase the number of medication interventions a pharmacist can
D: Create a comprehensive treatment plan that outlines a specific course

Identify a step necessary to establish a pharmacists autonomy in a new interdisciplinary service
A: Create a clinical competency and exam to educate the pharmacist
B: Develop a protocol with key stakeholders outlining a pharmacists' role
C: Develop a progress note to document telephone encounters and triage
D: Send out a follow-up questionnaire to assess pharmacists' impact

Q1 Answer: D Q2 Answer: B

ACPE Universal Activity Number 121-999-11-388 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5
Extended-infusion piperacillin/tazobactam (EI-PT) is one of the most widely used beta-lactams for initial empiric treatment of HCAP in patients with suspected Multi-Drug Resistant (MDR) pathogens including Pseudomonas aeruginosa. Currently at Grant Medical Center (GMC) in Columbus Ohio, when a patient is suspected to have HCAP, P/T is dosed at 4.5g every 6 hours given over a 30-minute infusion (traditional infusion). Recent literature suggests that prolonging the infusion time from 30-minutes to 4-hours (extended-infusion) improves efficacy and decreases costs by optimizing the pharmacodynamic properties of P/T.

Extended-infusion piperacillin/tazobactam (EI-PT) has been associated with similar outcomes in patients with gram-negative infections, superior outcomes in critically ill patients with Pseudomonas aeruginosa infections, and in both cases less cost compared to traditional-infusion piperacillin/tazobactam (TI-PT). P/T therapy is most effective when the drug concentration exceeds the minimum inhibitory concentration (MIC) for 40%-60% of the dosing interval. Two different E-PT regimens have been implemented by multiple hospitals throughout the United States over the last decade. Only the 3.375g EI-PT regimen has been clinically evaluated against TI-PT of 3.375g every 4-6 hours infused over 30 minutes. On October 4, 2010 GMC implemented a hospital wide conversion to EI-PT. The infusion smart-pumps at GMC originally only contained the data for the 4.5g EI-PT regimen and in January of 2011 GMC converted to the 3.375g EI-PT protocol via an infusion smart-pump update. Primary study endpoints will include total length of ICU stay beginning at first dose of P/T, and total cost of P/T therapy. Secondary outcomes will include time to defervesence ≥24 hours, time to leukocytosis resolution, P/T MIC sensitivity data, total length of P/T therapy, and 14-day mortality. Subgroup analyses will stratify patient groups by organism identified, organism MIC value, past medical history, and APACHE II scores.

Learning Objectives:

- Explain the pharmacodynamic rationale for using extended-infusion piperacillin/tazobactam.
- Review the current literature supporting the use of extended-infusion piperacillin/tazobactam.

Self Assessment Questions:

Which of the following pharmacodynamic properties of beta lactam antibiotics is the best measurement for effectiveness?

A: Peak concentration  
B: AUC to MIC ratio  
C: Time of free drug concentration above the MIC  
D: Trough concentrations

Which of the following statements most accurately describes the current literature supporting the use of extended-infusion piperacillin/tazobactam therapy?

A: EI-PT decreases length of stay and mortality in ALL patients compared to TI-PT  
B: EI-PT is ASSOCIATED with decreased length of stay and mortality  
C: EI-PT is not associated with improved outcomes compared to TI-F  
D: EI-PT is not cost effective

Q1 Answer: C Q2 Answer: B

ACPE Universal Activity Number: 121-999-11-347-L01-P  
Activity Type: Knowledge-based Contact Hours: 0.5
SEDATION IN PATIENTS WITH DELAYED STERNAL CLOSURE

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Background and Purpose: Surgeries that involve prolonged cardiopulmonary bypass cause an inflammatory response, which leads to edema. This edema can cause external pressure on the heart upon sternal closure, decreasing cardiac output. When this occurs in pediatric patients after cardiovascualar surgery, closure of the sternum can be delayed for 24 to 72 hours until the edema resolves. Post operative management for patients with delayed sternal closure (DSC) involves mechanical ventilation and paralysis with a neuromuscular blocker. These patients should be adequately treated with opioids for pain and benzodiazepines for agitation. They should be monitored using observational and physical signs of pain to ensure the correct level of sedation and appropriate pain control.

Previous studies have recommended the adequate use of pain and sedation management in patients with DSC. However, these studies did not evaluate pain and sedation medication requirements or determine if management was adequate in the DSC population. The objective of this study is to define the requirements for pain and sedation medications in patients with delayed sternal closure.

Methods: This study included pediatric patients who were admitted to pediatric cardiovascular surgery at Riley Hospital for Children between January 1, 2008 and August 31, 2010. A retrospective chart review was performed for all patients less than 2 years old with a congenital heart defect who had an open sternum for at least 24 hours after cardiac repair involving cardiopulmonary bypass. Data was collected concerning the patients cardiac surgery, vital signs, and amounts of opiates, benzodiazepines, and neuromuscular blockers received. DSC patients were paired with closed sternum patients based on similar congenital heart defects and surgeries so that the data collected could be compared between groups. Statistical analysis involved descriptive statistics and an independent sample t-test.

Results and Conclusion: To be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Describe the rationale for delayed sternal closure after cardiac repair surgery.
Discuss appropriate post-operative management of pediatric patients with delayed sternal closure.

Self Assessment Questions:
Which of the following is an indication for delayed sternal closure after cardiac repair surgery?
A: Sternal instability
B: Chest wall edema
C: Infection
D: Use of cardiopulmonary bypass

Which of the following are recommended medications for post-operative management of patients with delayed sternal closure?
A: Opioids, benzodiazepines, and neuromuscular blocking agents
B: Opioids only
C: Opioid and neuromuscular blocking agent only
D: Neuromuscular blocking agent only

Q1 Answer: B  Q2 Answer: A

ACPE Universal Activity Number 121-999-11-112-L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5

PHARMACISTS AND STUDENT PHARMACISTS KNOWLEDGE AND ATTITUDES ABOUT PROVIDING HIV/AIDS MEDICATION THERAPY MANAGEMENT AND POINT-OF-CARE HIV TESTING

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Objectives:
The study objective is to assess pharmacists and student pharmacists knowledge and attitudes in relation to providing HIV/AIDS medication therapy management and point of care HIV testing.

Methods:
This cross-sectional study will use a voluntary, anonymous web-based survey distributed to a sample of pharmacists and student pharmacists who are members of a professional pharmacy association in Illinois. Potential respondents will be emailed a cover letter with a link to the survey instrument. The survey will capture respondents demographic information, knowledge of HIV/AIDS management, beliefs of pharmacists responsibility in providing HIV/AIDS medication therapy management, and personal degree of comfort with providing HIV/AIDS medication therapy management and HIV testing. A follow-up email request will be sent 10 days after the initial invitation to encourage additional participation.

Respondent demographics will be reported using descriptive statistics. Comparisons between demographic groups will be made with chi-square or Fishers exact test, where appropriate. Knowledge and attitude will be reported using a 5-point Likert scale and will be analyzed as ordinal data summarized by frequencies overall and by demographic category. Multivariate logistic regression analysis (reported as adjusted odds ratios and 95% confidence intervals) will be performed to evaluate demographic predictors. Survey distribution is scheduled to begin February 1, 2010.

Preliminary Results:
Pending

Learning Objectives:
Discuss the current Center for Disease Control recommendations for HIV screening.
List the criterion for diagnosis of Acquired Immunodeficiency Syndrome.

Self Assessment Questions:
According to current CDC recommendations, which of the following regarding HIV screening is true?
A: HIV screening should only be performed when a patient requests it
B: All patients initiating treatment for TB should be screened routinely
C: Sex partners of injection-drug users are not at high risk for HIV.
D: HIV screening should be involuntary.

Which of the following would lead to an AIDS diagnosis in a patient with HIV?
A: CD4 count of 250
B: Vaginal candidiasis
C: Esophageal candidiasis
D: HIV viral load of 750,000

Q1 Answer: B  Q2 Answer: C

ACPE Universal Activity Number 121-999-11-132-L02-P
Activity Type: Knowledge-based  Contact Hours: 0.5
EVALUATING THE EFFECT OF A CPOE ALERT ON THE ADDITION OF LIDOCAINE TO POTASSIUM CHLORIDE IVPBS IN A LARGE TERTIARY CARE HEALTH SYSTEM

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Purpose:
The addition of lidocaine to potassium chloride (KCl) IVPBs is a controversial approach for attenuating pain associated with peripheral administration of KCl. Medication safety concerns surrounding this approach have led to the development of a policy at our institution, which delineates non-pharmacologic measures that should be attempted before adding lidocaine to KCl IVPBs. Alternative measures presented in the policy may not be utilized in every patient. Consequently, a CPOE alert was generated to notify prescribers of this policy. We evaluated the impact of this alert on the addition of lidocaine to KCl IVPBs.

Methods:
This is a retrospective cohort study. Patients having received at least one dose of KCl IVPB with or without lidocaine over a 20-day time period before and after CPOE alert implementation were included. Patients less than 18 years of age, pregnant patients, and patients with prisoner status were excluded. Patients were identified using an institutional medical record database. The primary endpoint was the percentage of KCl with lidocaine IVPBs administered. The secondary endpoint was the percentage of subjects not having received KCl without lidocaine prior to receiving KCl with lidocaine. Descriptive statistics were used to analyze demographic data.

Preliminary Results:
From the period before CPOE alert implementation, 137 subjects were evaluated. Of all the KCl IVPBs administered (n=535 IVPBs), 15% (n=81 IVPBs) contained lidocaine. Of subjects having received KCl with lidocaine IVPB (n=32 subjects), 50% (n=16 subjects) did not receive KCl without lidocaine prior to receiving KCl with lidocaine. Descriptive statistics were used to analyze demographic data.

Conclusions:
The addition of lidocaine to KCl IVPBs is commonly ordered for the control of infusion pain.

Learning Objectives:
Recognize the patient safety concerns associated with the addition of lidocaine to potassium chloride IVPBs.
Describe non-pharmacologic measures used to control infusion pain associated with peripheral administration of potassium chloride.

Self Assessment Questions:
Which of the following is a medication safety concern associated with the addition of lidocaine to potassium chloride IVPBs?
A: Nephrotoxicity
B: Exacerbation of hypokalemia
C: Seizures
D: Medication error
Which of the following is an acceptable modification to the patients IV potassium replacement therapy for attenuating infusion pain?
A: Further concentrating the potassium
B: Changing the diluent
C: Using a higher solution osmolarity
D: Slowing the infusion rate
Q1 Answer: D Q2 Answer: D

STANDARDIZING METHADONE WEANS IN THE NEONATAL INTENSIVE CARE UNIT

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Purpose: Neonates who are premature or critically ill receive opioids in order to decrease pain, anxiety, morbidity and mortality. Physical dependence can develop following abrupt cessation of the opioid. Certain disease states, such as gastrochisis and bronchopulmonary dysplasia, can prolong opioid weaning as it is often difficult to determine if symptoms are due to withdrawal or the disease.

Methods: This is both a retrospective and prospective chart review study conducted at Childrens Hospital of Wisconsin in Wauwatosa, Wisconsin. Patients in the retrospective portion of this study, included patients admitted to the neonatal intensive care unit and received methadone for iatrogenic neonatal abstinence syndrome (NAS) between January 1, 2009 and September 30, 2010. Following implementation of the methadone weaning guidelines, a prospective evaluation will be conducted in order to determine its efficacy.

Results: The retrospective portion showed a wide variation in weaning practices and there is a need for standardizing methadone weans. Patients who has procedures during the wean had prolonged weans compared to those that did not undergo procedures. NAS scores were increased in when methadone was weaned on procedure days or weaned daily during the first 7 days. Methadone was weaned in 56% of patients despite NAS scores being greater than 8. Duration of opioid therapy or duration at peak opioid rate did not impact the duration of the methadone wean. Methadone weaning guidelines have been proposed. Following implementation of the weaning guidelines, a prospective evaluation will be conducted.

Conclusion: The guidelines along with preliminary results from the prospective evaluation will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Describe the challenges associated with opioid weaning in neonates.
Describe what information should be taken into consideration when evaluating neonatal abstinence syndrome (NAS) withdrawal scores.

Self Assessment Questions:
When evaluating neonatal abstinence syndrome (NAS) withdrawal scores, it is important to take into consideration which of the following?
A: Time of rescue medication administration in relationship to NAS scores
B: Time of scheduled methadone administration in relationship to NAS scores
C: Time of procedures in relationship to NAS scores
D: All of the above
Which of the following have been shown to contribute to prolonged opioid weans?
A: Practice variability among practitioners
B: Procedures or operations during the methadone wean
C: Concomitant disease states
D: All of the above
Q1 Answer: D Q2 Answer: D

ACPE Universal Activity Number 121-999-11-183-L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
INTRAVENOUS AMIODARONE LOADING DOSES FOR ATRIAL FIBRILLATION TO MAINTAIN NORMAL SINUS RHYTHM

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Background/Purpose: Atrial fibrillation (AF) is a common arrhythmia that affects patients in both community and hospital settings. Rate and rhythm-control are therapeutic strategies in the management of AF. In patients treated with rhythm control, amiodarone has proven to be the most effective option for conversion and maintenance of normal sinus rhythm (NSR). The American College of Cardiology (ACC) and the American Heart Association (AHA) recommend amiodarone loading doses of 10 grams, but do not mention the preferred route or when to switch from intravenous (IV) to oral formulations. The purpose of this study is to determine if the total loading dose of IV amiodarone before conversion to an oral formulation impacts maintenance of NSR.

Methods: This is an Institutional Review Board approved retrospective cohort analysis comparing loading doses of amiodarone in patients with AF. Patients who received IV amiodarone for AF while hospitalized at the University of Chicago Medical Center between June 2008 and September 2010 will be reviewed. Patients will be stratified to those who received < 2 grams or ≥ 2 grams of IV amiodarone prior to converting to the oral formulation. Patients with AF will be identified using ICD-9 codes and amiodarone doses will be obtained from electronic medical records. Physicians will aid by interpreting archived rhythm strips for NSR or AF from the time of IV amiodarone initiation until a total loading dose is received (equivalent to 10 grams oral amiodarone) or patient discharge. The primary endpoint is maintenance of NSR after IV to oral amiodarone conversion. Selected secondary endpoints include time to recurrence of AF after IV to oral conversion, amount of oral amiodarone received before AF recurrence, mean IV dose that maintains NSR, and length of stay.

Results/Conclusions: To be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Review the 2006 AHA/ACC guidelines for the use of amiodarone in the treatment of AF.
Discuss the value of larger amiodarone loading doses given intravenously to maintain normal sinus rhythm.

Self Assessment Questions:
The authors of the AFFIRM trial concluded through their study that:
A There is no statistically significant survival advantage between rate
B: There is a statistically significant survival advantage in favor of the
C: There is a statistically significant survival advantage in favor of the
D: There is a statistically significant survival advantage in favor of no

Amiodarone is classified as which one of the following Vaughan-Williams antiarrhythmic classes?
A I
B II
C III
D IV

Q1 Answer: A  Q2 Answer: C

COMPARATIVE EVALUATION OF MORTALITY, MORBIDITY, AND COST OF PROPOFOL, DEXMEDETOMIDINE, AND BENZODIAZEPINES FOR INTENSIVE CARE UNIT SEDATION

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Purpose: Delirium is an independent risk factor for mortality in intensive care unit (ICU) patients and has been associated with the use of sedatives. The objective of this study is to determine the impact of chosen sedation strategy in ICU patients on mortality, morbidity, and overall costs.

Methods: After institutional review board approval, a retrospective chart review of ICU patients receiving sedation was performed. Patients greater than 18 years of age treated with propofol, dexmedetomidine, lorazepam, or midazolam for sedation during the ICU admission were included. Patients who received solely procedural sedation, who were unable to be assessed for sedation or delirium due to underlying neurologic conditions, and patients receiving one of the sedative agents for the control of status epilepticus were excluded. Charts have been evaluated for baseline patient characteristics, sedation agent used, average dose of agent per body weight, duration of sedation in days, use of intermittent or continuous sedation, sedation level by modified Ramsay score, presence of delirium, mechanical ventilation use, concomitant analgesic and paralytic therapy, length of ICU stay, length of hospital stay, mental status at discharge, and death. All data has been depersonalized and maintained confidentially. An overall cost comparison of sedation strategy will be performed after the primary and secondary outcome data are available.

Preliminary Results: Out of 1082 identified patients who received non-procedural sedation, 634 patients met inclusion criteria. The first 100 patients in 2010 who were not eligible for exclusion were identified as the patient population to be studied. Data collection is ongoing.

Conclusions: Final results will be presented at the 2011 Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Recognize drug and non-drug causes of delirium in intensive care unit patients.
Discuss the pros and cons of common sedation regimens.

Self Assessment Questions:
Which of the following medication classes has been implicated as a cause of delirium in intensive care unit patients?
A: non-steroidal anti-inflammatory drugs
B: calcium channel blockers
C: benzodiazepines
D: proton pump inhibitors

Which of the following statements is correct regarding common sedation regimens?
A: Dexmedetomidine has been shown to increase the duration of delirium
B: Benzodiazepine-based sedation has been linked to longer duration
C: Dexmedetomidine is more likely to cause delirium than benzodiazepines
D: The onset of action of lorazepam is shorter than propofol.

Q1 Answer: C  Q2 Answer: B

ACPE Universal Activity Number 121-999-11-159 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
CONTINUOUS RENAL REPLACEMENT THERAPY AND FLOW RATE INFLUENCE ON CEFEPIME PHARMACOKINETICS IN CRITICALLY ILL PATIENTS
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Purpose:
Gram-negative pathogens are a prevalent cause of morbidity and mortality in healthcare settings. Cefepime is a broad-spectrum, fourth-generation, cephalosporin antibiotic often used empirically for late-onset hospital-acquired pneumonia. The pharmacokinetics of cefepime are poorly described in critically ill patients receiving high-flow continuous renal replacement therapy (CRRT) (e.g., ultrafiltration and dialysis flow rates 35 mL/kg/hr or 3,000-4,000 mL/hr for 80-110 kg patient). This study plans to measure cefepime pharmacokinetics in critically ill medical and surgical patients receiving high-flow continuous venovenous hemofiltration (CVVH) or hemodialysis (CVVHD).

Methods:
This is a prospective pharmacokinetic study. Patients at least 18 years of age admitted to the medical (MICU) or surgical (SICU) intensive care units at UC Health-University Hospital, a regional level-1 trauma, tertiary medical center in Cincinnati, Ohio, receiving cefepime 2 g IV infused over 30 minutes every 8 hours during CRRT will have pre- and post-membrane plasma samples collected, along with coordinated effluent samples, at 0.5 hour, 2, 4, and 8 hours after the third or fourth dose. Conventional and CRRT-related cefepime pharmacokinetic parameters will be calculated. Linear regression analysis also will be performed to determine correlation coefficients for flow rate vs. cefepime clearance to evaluate the influence of CRRT modality and flow rate on cefepime clearance. Cefepime pharmacokinetic parameters will be compared between CVVH and CVVHD and absolute, weight-unadjusted flow rates based on patient inclusion. A total of 12 patients are planned to be enrolled.

Preliminary Results / Conclusions:
Data collection and evaluation is being conducted.

Learning Objectives:
Discuss the importance of pharmacokinetic-pharmacodynamic principles in the management of infection in critically ill patients.
Review current literature supporting antibiotic dosing during continuous renal replacement therapy.

Self Assessment Questions:
Which of the following principles are important to consider in dosing recommendations during CRRT:
A: Renal elimination of the drug
B: Volume of distribution of the drug
C: Minimum inhibitory concentration of the pathogen
D: All the above

Current literature may not provide adequate cefepime dosage recommendations for different CRRT modalities because:
A: Different CRRT modalities were directly compared in past studies.
B: Different filter surface areas are used in current practice when compared to historical studies.
C: Changes in cefepime drug formulations impact drug removal when compared to historical dosing recommendations.
D: Higher ultrafiltration flow rates are used in current practice when compared to historical dosing recommendations.

Q1 Answer: D  Q2 Answer: D
ACPE Universal Activity Number 121-999-11-278 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

DEXMEDETOMIDINE ALONE OR IN ADDITION TO STANDARD THERAPY COMPARED TO STANDARD THERAPY FOR MECHANICAL VENTILATION SEDATION AND WEANING AFTER CORONARY ARTERY BYPASS GRAFT SURGERY.
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Purpose:
Duration of postoperative intubation with mechanical ventilation is a critical factor in morbidity and mortality outcomes. Standard ICU sedation therapies can cause respiratory depression and deep sedation which may delay successful patient extubation. Dexmedetomidine is a selective, short-acting alpha-2 adrenergic agonist that is FDA approved for the sedation of intubated and mechanically ventilated patients in the intensive care unit. Its unique mechanism of action does not cause respiratory depression and as such can potentially decrease the amount of time a patient remains intubated. The purpose of this study is to compare duration of mechanical ventilation between patients who received dexmedetomidine alone or in addition to standard therapy of fentanyl, midazolam, or propofol and patients only receiving standard therapy postoperatively following coronary artery bypass graft (CABG).

Methods:
This is a retrospective, cohort study at a 468-bed tertiary medical center. Patients 18 years and older who were admitted to the cardiothoracic vascular unit following CABG-only surgery and were intubated and mechanically ventilated will be eligible for evaluation. Patients who presented pregnant, with a left ventricular ejection fraction less than 30%, on renal replacement therapy, or who expired prior to extubation will be excluded. Patients will be stratified according to postoperative therapy: standard therapy compared to dexmedetomidine adjunct to standard therapy or alone. Baseline demographic data as well as treatment and procedure-specific data will be collected. The primary outcome of this study is duration of mechanical ventilation. Secondary outcomes include both ICU and hospital length of stay.

Results:
697 patients were reviewed for inclusion in the study. 71 patients were excluded according to predetermined criteria. 626 patients will be included in analysis: 133 in the dexmedetomidine arm and 493 in the standard therapy arm. Data analysis is ongoing and comprehensive results will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Describe the unique mechanism of action of dexmedetomidine.
Discuss potential benefits of the utilization of dexmedetomidine for mechanical ventilation sedation.

Self Assessment Questions:
Dexmedetomidine acts as an ____________ to exhibit its therapeutic actions
A: agonist at the alpha receptor
B: antagonist at the alpha receptor
C: agonist at the mu receptor
D: antagonist at the mu receptor

Which of the following properties have been associated with dexmedetomidine?
A: Analgesia
B: Respiratory depression
C: Sedation
D: A and C

Q1 Answer: A  Q2 Answer: D
ACPE Universal Activity Number 121-999-11-278 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
EVALUATION OF INPATIENT WARFARIN MANAGEMENT IN A COMMUNITY HOSPITAL

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Purpose: In 2009, The Joint Commission implemented National Patient Safety Goal (NPSG) 3E. This safety goal stated, "Reduce the likelihood of harm associated with the use of anticoagulation therapy". This goal incorporates appropriate warfarin dosing, achieving therapeutic INRs, reducing the likelihood of adverse drug events (e.g. bleeding and thrombosis), and education. Warfarin order sets were designed to help physicians manage warfarin but are only used 6% of the time at this institution. This project will evaluate compliance with The Joint Commission National Patient Safety Goal (NPSG) 3E aiming to reduce the likelihood of harm associated with anticoagulation therapy. The primary objective of this study is to evaluate warfarin management at St. Johns Hospital and to improve pharmacist knowledge of warfarin therap;

Methods: This study is a 2 month retrospective chart review of St. John's Hospitals current standard of care. It will review warfarin naive and adult patients who have received warfarin from January 1st, 2010- February 28th, 2010. Subjects will be excluded if the baseline INR is above 1.3 or they require bridge therapy with argatroban. The endpoints that will be measured are time to therapeutic INR, rates of supratherapeutic INR, bleeding, thromboembolic event (DVT or PE), vitamin K administration and if patient education was documented. Pharmacists will also be educated on warfarin management.

Results/Conclusions: Preliminary results and conclusions will be presented at the Great Lakes Pharmacy Conference.

Learning Objectives:
Identify confounding factors that may interfere with warfarin in a hospitalized patient.
Recognize areas to optimize warfarin management.

Self Assessment Questions:
In most patients, the most common dose initiated is 5 mg. In what patient populations might the initial dose be ≤ 5 mg of warfarin?
A. Patients with an NPO diet
B. Elderly
C. Renal Failure
D. Only A and B

Why is overlapping heparin and warfarin therapy necessary ("bridge therapy")?
A. Warfarin has a long half-life
B. Enoxaparin has a long half-life
C. LMWH and unfractionated heparin are synergistic with warfarin
D. Protein C and S

Q1 Answer: D  Q2 Answer: D

ACPE Universal Activity Number  121-999-11-266 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5

DEVELOPMENT OF A PHARMACIST-DIRECTED PREVENTIVE CARE SERVICE TO ASSESS HEALTH RISKS AND PROVIDE FEEDBACK TO IMPROVE EMPLOYEE HEALTH

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Purpose: Though pharmacists often have active clinical roles in both acute care and chronic care, the area of preventive care has previously been largely ignored. The U.S. Preventive Services Task Force (USPSTF) has developed evidence-based guidelines detailing various recommendations for screenings, education, and preventive medicine that are recommended based on age and sex. The purpose of this study is to develop and evaluate a pharmacist-directed program using the USPSTF guidelines to determine appropriate screening, educational, and preventive medicine interventions for patients of a university-based, disease state management program. To determine the possible impact of a pharmacist on preventive care, the number of recommendations recognized as unmet, the number of unmet interventions able to be performed directly by a pharmacist, and the total number of interventions performed will be analyzed.

Methods: Participants who are at least 18 years of age and an employee, dependent, or retiree of the university will be eligible for program inclusion. Prior to a one-on-one pharmacist visit, patient age, sex, pregnancy status, tobacco use status, and sexual activity status will be input into the USPSTF online search tool, and a list of patient-specific evidence-based recommendations will be retrieved from the search tool. The pharmacist will review these recommendations with the patient and use them to develop a patient-specific plan for screenings, education, and preventive medicine as recommended by the USPSTF. Pharmacists will provide screening and education as appropriate, assess additional medical needs, and encourage patient communication with other healthcare professionals as needed.

Results/conclusions: Data collection is ongoing. Full results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Discuss the current roles of the pharmacist in chronic care and the need for increasing preventive services.
Describe the U.S. Preventive Services Task Force guidelines for prevention and the incorporation of such preventive care services into the ambulatory care practice of pharmacy.

Self Assessment Questions:
Education regarding a specific disease state which allows the patient to take an active role in his or her care is the definition of
A. Medication therapy management
B. Pharmaceutical care
C. Disease state management
D. Pharmacist-directed care

Information necessary for an initial screen of patients using the U.S. Preventive Services Task Force search tool includes which of the following?
A. Weight
B. Tobacco use
C. Alcohol use
D. Height

Q1 Answer: C  Q2 Answer: B

ACPE Universal Activity Number  121-999-11-204 -L04-P
Activity Type: Knowledge-based  Contact Hours: 0.5
PHARMACIST OPTIMIZATION OF DRUG THERAPY FOR LIPID MANAGEMENT IN KIDNEY AND HEART TRANSPLANT PATIENTS

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Purpose: Kidney and heart transplant patients pose a significant risk for increased lipid levels due to a variety of factors including side effects of anti-rejection medications and the nature of their disease states. The relationship between elevated cholesterol and coronary heart disease (CHD) has been firmly established. Maintaining lipid levels at goal ranges set forth by national guidelines has been associated with lower risks of CHD. Currently, there are no studies assessing a pharmacist-run lipid protocol within a transplant center. However, literature has shown pharmacist-run lipid clinics to be effective in achieving cholesterols in the general population and additionally, some studies have shown achieved lipid goals to be greater with pharmacist intervention versus traditional physician management. The purpose of this study is to assess the optimization of lipid therapy management through pharmacist intervention within the heart and kidney transplant population.

Methods: This is an IRB approved, prospective, open-label, self-control study. Approximately 60 patients (30 patients from both kidney and heart transplant) will be enrolled through the Lutheran Hospital Transplant Center from January 20th through February 17th, 2011. Interventions in lipid therapies will be made by a pharmacist based on lipid profiles and baseline labs including liver function tests, fasting blood glucose, thyroid stimulating hormone, and creatinine kinase. These patients will have follow-up labs 6 weeks after an initial visit, and follow-up discussion will take place via a clinic visit or phone call. Data will be analyzed for primary endpoints of changes in LDL and triglycerides from baseline. Secondary endpoints include changes in total cholesterol, non-HDL cholesterol, and HDL from baseline, and adverse events.

Results/Conclusions: Data collection and analysis is currently in process and will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Explain the factors that complicate management of lipids in transplant patients.
Identify lipid goals in the transplant population.

Self Assessment Questions:
Which of the following is a major contributor in complicating lipid management in transplant patients?

A. The transplant itself causes hyperlipidemia.
B. Lipid lowering medications are contraindicated in transplant patient.
C. Commonly prescribed anti-rejection medications have side effect.
D. Transplant patients are resistant to lipid lowering medications.

Which of the following are the lipid goals for the transplant population?

A. LDL ≤ 130; TG ≤ 150; Total Cholesterol ≤ 200; HDL ≥ 60
B. LDL ≤ 100; TG ≤ 150; Total Cholesterol ≤ 200; HDL ≥ 40
C. LDL ≤ 100; TG ≤ 200; Total Cholesterol ≤ 150; HDL ≥ 60
D. LDL ≤ 130; TG ≤ 200; Total Cholesterol ≤ 150; HDL ≥ 40

Q1 Answer: C  Q2 Answer: B

ACPE Universal Activity Number 121-999-11-192 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5

EVALUATION OF HIGH-DOSE INSULIN IN CALCIUM CHANNEL BLOCKER AND/or BETA-BLOCKER TOXICITY

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Background:
Calcium channel blockers and beta-blockers represent the majority of overdoses associated with cardiovascular drugs. These medications when taken in toxic amounts have been shown to cause significant morbidity and mortality. Treatment of patients with suspected calcium channel blocker and beta-blocker overdose is challenging. Traditional decontamination and supportive measures with vasopressors are the mainstays of initial care, but are not always effective in patients presenting with severe ingestions of these cardiovascular medications. In many healthcare organizations, high-dose insulin has become an efficacious option for patients presenting with calcium channel blocker and beta-blocker overdose. However, the timing of therapy and order of therapy still remains unclear. Due to this, it is deemed worthwhile to evaluate the timing of patients receiving high dose insulin for calcium channel blocker and beta-blocker overdose and the impact it has on vasopressor use, intensive care unit (ICU) length of stay, and mortality.

Purpose:
Evaluate patients receiving high-dose insulin for calcium channel blocker and beta-blocker overdose and the impact it has on vasopressor use, ICU length of stay, and mortality.

Methods:
The Institutional Review Board-approved retrospective study includes patients < 99 years of age admitted to hospitals located within the Detroit Medical Center with a suspected calcium channel blocker and/or beta-blocker overdose.

Patient information that will be collected includes baseline demographics, past medical history, intubation status, treatment therapies, vasopressor use, ICU length of stay, hospital mortality, hemodynamic parameters at baseline and during treatments, high-dose insulin use, duration and dose, liver function tests, serum potassium levels, finger stick glucose, intravenous and intrathoracic pacing use, dose of offending agents, and co-ingestants. Patients who receive high-dose insulin will be compared to patients not receiving high-dose insulin for calcium channel blocker and beta-blocker overdose.

Results:
Results and conclusions to be presented at the Great Lakes Residency Conference.

Learning Objectives:
Review current treatment options for calcium channel blocker and beta-blocker toxicity.
Discuss outcomes associated with the appropriate use of high-dose insulin in patients with suspected calcium channel blocker and/or beta-blocker overdose.

Self Assessment Questions:
The use of high dose insulin in calcium channel blocker and beta-blocker toxic ingestions provides

A. negative inotropic effects
B. positive inotropic effects
C. vasodilatory effects
D. negative chronotropic effects

Hallmark signs of toxicity of a calcium channel blocker or a beta-blocker overdose are

A. bradycardia and hypertension
B. tachycardia and hypertension
C. bradycardia and hypotension
D. tachycardia and hypotension

Q1 Answer: B  Q2 Answer: C

ACPE Universal Activity Number 121-999-11-051 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
IMPLEMENTATION AND EVALUATION OF INSTITUTE FOR HEALTHCARE IMPROVEMENT (IHI) ADE TRIGGERS AT NORTHSHORE UNIVERSITY HEALTHSYSTEM
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Purpose:
Adverse drug events (ADEs) are the most common adverse events that occur in hospitalized patients, continually placing patients at risk of injury. Hospitalized ADEs account for up to 20% of all adverse events and can lead to prolong hospital stays which result in increased health care costs. The Joint Commission requires that hospitals have a continuous drug surveillance program to monitor and evaluate the effects of medications. Traditional methods, such as chart audits and voluntary reporting of ADEs have been shown to be impractical due to high costs and lack of efficiency.

The Institute of Healthcare Improvement (IHI) developed triggers to detect and alert health care professionals of possible ADEs. This tool can be used to monitor adverse events, assess the level of harm, and to determine whether adverse events are reduced over time as a result of practice changes. The ultimate goal of trigger tool monitoring is to improve patient safety in an effective, low-cost, efficient manner. At NorthShore University HealthSystem, reporting of ADEs is voluntary, which has the potential to have low detection rates. The purpose of this project is to utilize the electronic health record to generate reports of select ADE triggers to identify and track potential adverse events.

Methods:
A multidisciplinary team, consisting of representatives from Pharmacy, Quality, and Medical Informatics, selected specific medication-related IHI triggers. Automated reports will be generated from the electronic health record and validated by the team to track and select the selected triggers. Statistical control charts will be developed for each of the selected triggers. Results will be incorporated into NorthShores existing performance improvement program.

Results/Conclusion:
Analysis of results is ongoing. Results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Define adverse drug event (ADE).
List the Institute for Healthcare Improvement (IHI) ADE triggers.

Self Assessment Questions:
Which of the following statement(s) are correct?
A ADEs are the least common adverse events that occur in hospitali
B ADE refers to an injury from a medication or lack of receiving the i
C Voluntary reporting of ADEs are known to have a high ADE detect
D All ADEs are preventable.

Which of the following are examples of IHI ADE triggers?
A Insulin administration for glucose > 180 mg/dl, naloxone administr
B Vitamin K administration, sodium polystyrene sulfonate administr
C Glucose < 50 mg/dl, vitamin K administration, diphenhydramine ac
D d) Insulin administration for glucose > 180 mg/dl, sodium polystyr

Q1 Answer: B   Q2 Answer: C

EVALUATION OF AN EMERGENCY DEPARTMENT PHARMACIST PROGRAM ON MEDICATION RECONCILIATION IN A COMMUNITY HOSPITAL
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Background:
The ED has the highest rate of preventable adverse events in the US, with approximately 70% of all AE being preventable. An ED pharmacist program was initiated at Franciscan Saint Margaret Health, with the primary responsibility of the ED pharmacist conducting admission medication reconciliation (MR). Prior to the initiation of the program, admitting nurses were solely responsible for the admission MR.

Purpose:
Evaluate the effectiveness of the ED pharmacist performing admission MR compared to the admitting nurse and to find opportunities to further advance the current ED pharmacist program.

Methods:
A retrospective chart review was conducted. A standardized data collection form was created which contained information on drug, dose, frequency, route of administration and indication. The primary endpoint was to assess the completeness of the admission MR. Secondary endpoints included measuring the impact of pharmacists performing admission MR on the discharge MR and time to order clarification. A survey was conducted of all ED staff to get feedback on current ED pharmacy services and to assess for future areas of additional pharmacist involvement.

Preliminary Results:
The percentage of admission and discharge MR completed without needing clarification was 90.8% (pharmacist) vs. 66.7% (nurse) and 56.8% (pharmacist) vs. 29.4% (nurse), respectively. The number of medications needing clarification was 4 (pharmacist) and 20 (nurse).

Conclusion:
Pharmacists improved the completeness of both admission and discharge MR and the quality of care to our patients. We plan to advance the role of the pharmacist in ED to include more clinical opportunities. Further data collection and analysis are currently in progress and will be presented at the GLPRC.

Learning Objectives:
Discuss the 2009 ASHP Statement on Pharmacy Services to the Emergency Department and the importance of having a pharmacist in the ED.
Describe the benefits of having a pharmacist in the ED at Franciscan Saint Margaret Health.

Self Assessment Questions:
According to the 2009 ASHP Statement on Pharmacy Services to the Emergency Department, pharmacy services to the ED would:
A Increase costs
B: Increase incidence of adverse drug events
C: Increase medication errors
D: Increase timely provision of drug information
The most common intervention made by the ED pharmacist at FSMH is:
A Providing drug information
B Minor adverse drug prevention
C ED staff education (eg. Inservice)
D Code attendance

Q1 Answer: D   Q2 Answer: B

ACPE Universal Activity Number 121-999-11-466-L05-P
Activity Type: Knowledge-based   Contact Hours: 0.5
PHARMACIST Driven Medication Reconciliation With Crestwood Care Center Patients at Advocate Christ Medical Center

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Purpose
To decrease readmissions and adverse events related to medications due to incomplete or incorrect medication reconciliation in patients admitted to Advocate Christ Medical Center (ACMC) from Crestwood Care Center (Crestwood), a nursing and rehabilitation center.

Methods
In the retrospective arm, the study pharmacist reviewed admissions of Crestwood patients to ACMC that did not have a pharmacist involved in medication reconciliation. The research pharmacist recorded medication discrepancies that occurred. If a drug was omitted, the dose, route, and frequency were all counted as an omission. If an adverse drug event occurred or was the cause of re-admission that was also recorded. In the prospective arm, the study pharmacist is notified when a Crestwood patient is admitted to ACMC. The study pharmacist evaluates the patients medication list from Crestwood, reviews and/or completes the patients medication reconciliation, and contacts the physician if there are any discrepancies. The study pharmacist will complete the discharge medication reconciliation with the physician. After the medication reconciliation is complete, a copy of the discharge medication list is faxed to Pharmerica (an institutional pharmacy service company that provides medications to Crestwood). A paper copy of the medication list is sent to Crestwood with the patient.

Results
In the retrospective arm, 57 patients were evaluated. Fewer medication discrepancies occurred when an admission medication reconciliation was completed. The total number of discrepancies found was 717. Omission of the route of medication was the most common discrepancy (151/717). In the prospective arm, 11 patients were reviewed to date. The study pharmacist completed 3 patient medication reconciliations, reviewed the nurses reconciliation on 7 patients, and completed the reconciliation with a nurse on 1 patient. The most common error found was omission of drug. The prospective study is ongoing.

Conclusion
Pharmacists involvement in medication reconciliation provides a more complete and accurate discharge medication list.

Self Assessment Questions:
1. What was the most common discrepancy found when pharmacists were not involved in medication reconciliation?
   A: Omission of drug
   B: Omission of dose
   C: Omission of route
   D: Omission of medication

What are the benefits of pharmacist driven medication reconciliation?
   A: Fewer medication related readmissions
   B: Decreased adverse events due to medications
   C: More complete medication lists and histories
   D: All of the above

Q1 Answer: C  Q2 Answer: D

ACPE Universal Activity Number 121-999-11-491-L05-P
Activity Type: Knowledge-based Contact Hours: 0.5

OPTIMIZING Diabetes Control IN A PHARMACIST-MANAGED DIABETES MELLITUS Clinic AT A COMMUNITY Family Medicine Center.

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Background/Purpose:
The American Diabetes Association (ADA) and the American Association of Clinical Endocrinologists have identified therapeutic treatment goals for the management of diabetes mellitus. These goals are often difficult to achieve, as evidenced by a chart review at a family medicine center that revealed 155 patients with an A1c >7%. In August 2010, a pharmacist-managed clinic was established under a Collaborative Drug Therapy Management (CDTM) agreement to manage uncontrolled diabetic patients. The objective of this study is to determine how pharmacist interventions with diabetic patients at a family medicine center impact the attainment of these goals and to assess patient satisfaction with these services.

Methods:
A retrospective chart review was performed screening diabetic patients between the ages of 18 and 75 years with a recorded Hemoglobin A1c (A1c) >7% within the last year and enrolled in the pharmacist-managed clinic.

To assess improvement in diabetes outcomes, the average A1c prior to enrollment in the clinic will be compared to the average A1c after intensive education and management from a pharmacist. The primary outcome of the study is the percentage of patients with improvement in A1c and the percentage of those reaching goal A1c of <7%. Secondary outcomes focus on achieving additional therapeutic goals and screenings for diabetic patients as identified by the Physician Quality Reporting Initiative (PQRI) and Healthcare Effectiveness Data and Information Set (HEDIS) measures.

After enrollment in the pharmacist-managed clinic, patient satisfaction will be assessed through a satisfaction questionnaire provided to patients who have had at least two office visits with the pharmacist. The questionnaire will assess whether patient perspectives on diabetes knowledge and disease state management improved after meeting with a pharmacist for intensive education.

Results/Conclusions:
Thirty patients have been enrolled in the pharmacist-managed clinic to date with an average baseline A1c of 10.2%. Data collection and analysis is ongoing. Results will be presented at the meeting.

Learning Objectives:
List the primary diabetes outcome goals for diabetic patients as identified by the Physician Quality Reporting Initiative (PQRI) and Healthcare Effectiveness Data and Information Set (HEDIS) measures.

Recognize how pharmacists can impact patient care for diabetic patients by working under a collaborative drug therapy agreement.

Self Assessment Questions:
Which of the following are three of the primary outcome measures for diabetic patients according to the PQRI and HEDIS measures?
   A: A1c <7%
   B: LDL <100 mg/dL
   C: Blood pressure <130/80 mmHg
   D: All of the above

Which of the following can a pharmacist impact in a patients diabetes care under a CDTM agreement?
   A: Improve attainment of diabetes outcomes
   B: Enhance patient understanding of diabetes
   C: Increase knowledge of medications
   D: All of the above

Q1 Answer: D  Q2 Answer: D

ACPE Universal Activity Number 121-999-11-166-L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
Purpose:
Cytomegalovirus (CMV) infection is a major cause of morbidity and mortality in solid organ transplant patients. The risk of developing CMV in transplant patients depends on the CMV status of both the donor and the recipient. The highest risk of infection is in the donor CMV positive (D+), recipient CMV negative (R-) group. D+/R+ or D-/R+ are considered intermediate risk. Universal prophylaxis is commonly employed to prevent CMV infections; however, no consensus exists for the optimal duration of prophylaxis and subsequent monitoring. The primary objective of this study was to determine the rate of late onset CMV infection (after prophylaxis has ended) in intermediate and high risk heart transplant patients at University of Chicago Medical Center. Secondary endpoints included evaluation of the potential risk factors for positive CMV PCR, including induction therapy used, high risk CMV serostatus, and anti-rejection therapy used. Time to develop CMV infection was also evaluated.

Methods:
Institutional Review Board approval was obtained. A retrospective case-controlled analysis was conducted, with a goal sample size of 125 patients. Patients were identified from the UCMC heart transplant database and electronic medical record. Patients who received a heart transplant at UCMC between January 1, 2004 and December 31, 2009 who were at intermediate or high risk of CMV infection and who were at least 18 years old at time of transplant were included. Matching based on age and gender was performed for the positive and negative CMV groups, and a multivariate analysis was completed to evaluate independent and dependent variables. Independent variables included the type of induction therapy used, high risk CMV serostatus, and exposure to anti-rejection therapy used. Time to develop CMV PCR was also evaluated.

Results/conclusions: To be presented

Learning Objectives:
Describe the importance of preventing late-onset cytomegalovirus in heart transplant patients.
Identify risk factors that are associated with the development of cytomegalovirus in heart transplant patients.

Self Assessment Questions:
Which of the following is true regarding the development of late-onset CMV?
A: It leads to decreased medication costs
B: It may be a predictor of mortality in the first year post-transplant
C: It is associated with decreased risk of rejection
D: It develops during the time patients are on antiviral prophylaxis

Which patients are at the greatest risk for developing CMV after transplant?
A: CMV donor positive/recipient negative serostatus
B: CMV donor positive/recipient positive serostatus
C: CMV donor negative/recipient positive serostatus
D: CMV donor negative/recipient negative serostatus

Q1 Answer: B Q2 Answer: A

Activity Type: Knowledge-based Contact Hours: 0.5

LEFT VENTRICULAR ASSIST DEVICE RELATED INFECTIONS IN BRIDGE-TO-TRANSPLANT VERSUS DESTINATION THERAPY PATIENTS USING CONTINUOUS FLOW DEVICES

Purpose:
Left ventricular assist devices (LVADs) have been shown to significantly reduce mortality in patients with end-stage heart failure. Because of the advantages inherent to the new generation of continuous flow devices, LVAD implantation has become an increasingly common therapeutic option in both the bridge-to-transplant (BTT) and destination therapy (DT) patient populations. However, LVAD implantation is associated with a risk of infection related to the device that has been reported in the literature as occurring in 22.1-50 percent of patients. The primary objective is to compare the incidence of device associated infections in the BTT LVAD utilization to DT LVAD utilization. The secondary objectives are to compare the time to first infection in BTT to DT patients, and to determine patient-specific risk factors associated with LVAD infections.

Methods:
A retrospective cohort analysis was conducted. Patient selection included all patients 18 years of age or older who underwent implantation of a continuous flow LVAD during the study period of October 1st 2008 to September 30th 2010. Data collected includes: patient demographics, co-morbidities, location prior to implant, type of LVAD, surgical characteristics (intraoperative time, transfusions, perioperative antibiotics), duration of VAD therapy, infection characteristics (organism, susceptibilities, antibiotics), and cause of death. The primary endpoint and baseline characteristics were analyzed using chi-square or Fisher's exact test as appropriate; a p-value of less than 0.05 was considered significant. The secondary endpoint of time to first infection was analyzed via a Kaplan-Meier analysis. A stepwise, forward univariate to multivariate logistic regression was used to compare risk factors for infection using chi-squared for categorical variables. Student's t-test for parametric continuous variables, and Wilcoxon rank-sum test for non-parametric continuous variables.

Results/Conclusion: Results will be presented.

Learning Objectives:
Describe the benefits and complications associated with LVAD utilization compared to optimal medical management.
Recognize features that are unique to the treatment of LVAD-associated infections.

Self Assessment Questions:
Which of the following are benefits of LVAD utilization compared with optimal medical management?
A: reduced infection risk
B: reduced mortality
C: lower thrombosis risk
D: reduced need for home care

Which of the following should be considered a contaminant when obtained from a driveline wound drainage culture?
A: coagulase-negative Staphylococcus
B: Staphylococcus Aureus
C: Pseudomonas Aeruginosa
D: none of the above

Q1 Answer: B Q2 Answer: D
With the increasing need for anticoagulation monitoring throughout the country, warfarin has solidified itself in becoming the most popular oral anticoagulant utilized for patients with stroke, deep vein thrombosis, pulmonary embolism, or atrial fibrillation histories. Due to unpredictable pharmacokinetics, drug interactions, and bleeding risks, the importance of warfarin monitoring continues to be a medication safety concern. At a rural community teaching hospital in western Kentucky, warfarin dosing may vary among clinical pharmacists providing anticoagulation services due to inconsistency in following existing protocols. Clinical pharmacists at our institution following patients who have undergone orthopedic procedures or for other indications upon consult. With an established relationship with several home health organizations, pharmacists also continue to monitor and adjust warfarin dosing following discharge from the hospital.

Methods:
A retrospective comprehensive review for the last 6 months of warfarin dosing strategies will be completed in order to identify dosing trends among our pharmacists and measure the rate and time of achieving therapeutic INRs. (International Normalized Ratio) Additionally, data will be collected on patients with supratherapeutic INRs and their subsequent management. It is the hope of this investigator to implement pharmacy services in all patients receiving warfarin therapy in the hospital following a review of adherence to existing anticoagulation protocols. Pending results of review, education will be provided in order to improve processes.

In order to justify pharmacy involvement in the management of patients receiving warfarin therapy, the review will also include patients not being followed by pharmacy. To ensure consistency between consulted and non consulted patients, only patients starting warfarin will be included in the analysis. Other variables analyzed shall include: warfarin education services by pharmacists, residents, and students, the average time to achieve therapeutic INR, and the number of patients discharged from hospital before having a documented therapeutic INR.

Learning Objectives:
Identify patient factors which must be taken into account when initially dosing warfarin.
Review management strategies for supratherapeutic INRs with warfarin therapy.

Self Assessment Questions:
Which of the following factors would need to be considered when starting someone on warfarin?
A: Comorbidities such as heart failure, hypertension, or chronic kidney disease
B: Concurrent therapy with amiodarone
C: Concurrent therapy with argatroban
D: All of the above

According to CHEST guidelines, the management of supratherapeutic INR with warfarin therapy with no significant bleeding and INR of 6.8 includes:
A: Administration of fresh frozen plasma
B: Omitting 1-2 warfarin doses
C: Administration of Vitamin K 10mg slow IV infusion + fresh frozen plasma
D: Administration of Vitamin K 10mg slow IV infusion

Q1 Answer: A  Q2 Answer: A

ACPE Universal Activity Number 121-999-11-055 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
DAPTOMYCIN DOSING BASED ON IDEAL BODY WEIGHT VS. ACTUAL BODY WEIGHT: COMPARISON OF CLINICAL OUTCOMES

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Purpose:
Daptomycin efficacy and toxicity are predicted by parameters such as the ratio of area under the curve (AUC) to minimum inhibitory concentration (MIC) and minimum concentration (Cmin). A well-known potential adverse effect of daptomycin is creatine phosphokinase (CPK) elevations which may lead to myopathy and rarely rhabdomyolysis. Obese patients when dosed based on actual body weight have higher estimated Cmin values which have been associated with an increased risk for CPK elevations. Dosing based on ideal body weight should lead to lower Cmin values and reduce the incidence of CPK elevations; however, it may also influence efficacy. The University of Wisconsin Hospital and Clinics updated the institutions daptomycin guidelines to recommend dosing based on ideal body weight. The purpose of this observational study is to determine if daptomycin dosing based on ideal body weight is non-inferior to dosing based on actual body weight with regards to clinical efficacy and safety for patients with documented MSSA, MRSA, or enterococcal infections.

Methods:
Patients who received at least 72 hours of daptomycin therapy for MSSA, MRSA, or enterococcal infection confirmed by culture will be enrolled in this study. Exclusion criteria include: osteomyelitis, endocarditis, pre-existing renal impairment, treatment with daptomycin prior to admission, and other factors that could significantly affect measures of efficacy or toxicity. The primary efficacy outcome is clinical success which will be determined by classifying patients into different categories (cure, improvement, failure). Microbiological success will be determined by classifying patients into different categories (documented eradication, presumed eradication, documented persistence, presumed persistence). Secondary outcomes include the incidence of adverse effects including CPK elevation, myopathy, rhabdomyolysis, and eosinophilia. Outcomes will be compared between patients who received doses based on ideal body weight vs. actual body weight.

Results:
Results and conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:
Define the most important pharmacokinetic parameters for daptomycin. Explain the rationale behind dosing daptomycin based on ideal body weight rather than actual body weight.

Self Assessment Questions:
The pharmacokinetic parameters that predict daptomycin efficacy and toxicity are __ and ___, respectively.
A Cmax/MIC and T>MIC
B AUC/MIC and T>MIC
C AUC/MIC and Cmin
D Cmax and Cmin

Which of these is a potential advantage of dosing daptomycin based on ideal body weight instead of actual body weight?
A Decreased doses will result in a higher T>MIC which is associated w...
B Decreased doses will result in a lower Cmin which is associated w...
C Decreased doses will result in a lower Cmax which is associated w...
D Decreased doses will result in a lower AUC which is associated w...
Q1 Answer: C Q2 Answer: B

FACTORS INFLUENCING PHYSICIANS COLLABORATION WITH GROCERY-CHAIN PHARMACISTS IN PROVIDING NON-DISPENSING SERVICES

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The new healthcare reform emphasizes the importance of healthcare professionals working collaboratively to improve patient outcomes. Despite the efforts and numerous studies that have shown benefit of collaborative relationships between pharmacists and physicians, including cost containment and disease state management, community pharmacists are still challenged with establishing a collaborative working relationship with physicians.

Objectives:
The primary objective is to expand upon a theoretical model of collaboration between pharmacists and physicians to determine factors that may affect physicians willingness to collaborate, including characteristics of a pharmacist. Secondary objectives are to determine the value of some non-dispensing services already being offered at a grocery chain pharmacy and to determine physicians preference for communication regarding services that may benefit their practice.

Methods:
This is a prospective, multi-site study that will assess the perceptions of subjects via an online survey. The top ten prescribing physicians from each store in a grocery chain will be identified through the computer software. Subjects will be excluded if they cannot receive faxes. Each physician will receive a faxed letter describing the intent of the research and an internet link to participate in a voluntary online survey. Each letter will include a unique identifier code to be submitted that will maintain anonymity. A follow up letter will be faxed 2 weeks and 4 weeks after the initial letter was sent. Subjects will be informed that participation in the survey authorizes the primary investigator to collect and analyze the survey data.

Conclusion:
Research is in the data collection phase and will be analyzed coding willingness to collaborate as a binary outcome and using multivariate logistic regression analysis.

Learning Objectives:
Recognize factors that may increase or hinder physician collaboration with community pharmacists on non-dispensing services. Identify physicians preferred method of communication with community pharmacists in regards to non-dispensing services.

Self Assessment Questions:
According to the American College of Physicians, what is the definition of a patient centered medical home?
A Healthcare professionals improving health outcomes by treating patients as unique individuals.
B Healthcare professionals encouraging patients to be proactive in their own health care.
C A model stressing the importance of healthcare professionals working together.
D A facility created for very ill patients who need specialized care.

Which of the following statements regarding the Pharmacist-Physician Collaborative Index (PPCI) is true?
A It provides qualitative information about the strength in collaborative relationships.
B It does not require an already established relationship between the pharmacist and physician.
C It is a useful tool to measure the number of referrals that a pharmacist can make.
D As the relationship develops over time, the scores on the PPCI show improvement.

Q1 Answer: C Q2 Answer: D

ACPE Universal Activity Number 121-999-11-168 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5
CHARACTERIZATION OF VANCOMYCIN DOSING IN OVERWEIGHT AND OBESE PEDIATRIC PATIENTS

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PURPOSE:
The prevalence of overweight and obesity in children and adolescents has increased dramatically in the last forty years. While there is literature available to guide dosing of vancomycin in adult patients, there is no literature to guide dosing in obese pediatrics. Due to the differences in drug distribution and elimination that pediatric patients exhibit, adult data should be extrapolated with caution. The objective of this study is to determine current vancomycin dosing practices in overweight and obese pediatric patients at our institution.

METHODS:
This is a retrospective chart review to characterize the dosing of vancomycin in overweight and obese pediatric patients at Riley Hospital for Children. The electronic medical records of included patients will be reviewed to identify initial dose (mg/kg) and frequency of administration of vancomycin. Patients will be included if they are age 2 to 17 years, have a body mass index which is greater than or equal to the 85th percentile for age, and received intravenous vancomycin as an inpatient at Riley Hospital for Children during the six month study period. Patients with cystic fibrosis or who received renal replacement therapy during treatment with vancomycin will be excluded. Data will be analyzed using descriptive statistics for mg/kg dosing of vancomycin, percentage of patients who received vancomycin dosed on actual body weight, and time to goal trough serum concentration. For patients with peak and trough serum concentrations, pharmacokinetic parameters will be calculated.

RESULTS AND CONCLUSION:
Data collection is ongoing. Results and conclusion will be presented at Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Review the definition of overweight and obese in children and adolescents and describe the trend in this population.
Identify which weight is recommended for use for vancomycin dosing in adult patients.

Self Assessment Questions:
Which of the following is the correct BMI to define obesity in children?
A: ≥ 95th percentile for age
B: ≥ 85th percentile for age
C: < 85th percentile for age
D: < 95th percentile for age
Which weight should generally be used to determine an initial vancomycin dose in an adult patient?
A: Ideal body weight
B: Actual body weight
C: Adjusted body weight
D: Lean body weight
Q1 Answer: A Q2 Answer: B

ACPE Universal Activity Number 121-999-11-355 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

COMPARING INFLUENZA VACCINATION RATES FOR PATIENTS WHEN EDUCATION IS PROVIDED TO ADDRESS CONCERNS

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Background: Seasonal influenza vaccination is the best way to prevent infection from influenza virus. Health disparities are prevalent among vaccine preventable diseases. Contributors to these disparities include access barriers such as cost and vaccination fears. At Parkview Hospital, influenza order sets are initiated upon admission and are used to determine eligibility and order the vaccine.

Purpose: The primary objectives of this study are to identify reasons for declining the vaccine and evaluate the effectiveness of vaccination education.

Methods: Inpatients who had not received the vaccine by day two of admission were screened. Eligible patients provided informed consent and were asked their reason for declining. For reasons including side effects or vaccination fears, education was provided. For reasons including previous receipt of the vaccine, religious beliefs, and personal choice, no additional information was provided. For cost, insurance status was evaluated to determine whether the vaccine was covered. For underinsured or uninsured patients, a grant was acquired to give vaccines to these individuals free of charge. If the patient subsequently agreed to the vaccine, the order set was reinitiated, and the vaccine was administered. If the patient declined, no additional information was added to the patients chart.

Preliminary Results: Data collection is currently ongoing through March 2011. 356 patients have been evaluated to date. Preliminary results show the most common reason for declining is fear of developing influenza from the vaccine (27.8%). 52 patients (14.6%) have agreed to vaccination after receiving education. However, 51.9% of these patients were not originally asked upon admission about receiving the vaccine.

Conclusion: Continued efforts in patient education regarding influenza vaccination are needed to ensure patients understand the benefit and to alleviate fears. Initiation of the order set upon admission should be evaluated as this timing may not be the most beneficial.

Learning Objectives:
Recognize the reasons patients are declining the seasonal influenza vaccine in a suburban population.
Identify strategies that can be implemented to increase vaccination rates in the inpatient setting.

Self Assessment Questions:
According to the Advisory Committee on Immunization Practices, which of the following individuals is/are eligible for the inactivated seasonal influenza vaccine?
A: 50 year old pregnant female with an allergy to eggs
B: 14 year old male who just received the MMR vaccine 2 days prior
C: 34 year old female with history of Guillain-Barré Syndrome
D: Healthy 4 month old male

The 2010 update for the Prevention and Control of Influenza with Vaccines published in the Morbidity and Mortality Report Weekly recommends that annual vaccination be administered to the following individuals:
A: Only high risk persons with chronic disease states
B: All persons aged ≥6 months
C: Persons showing signs/symptoms of influenza infection
D: Elderly and children only due to limited supply
Q1 Answer: B Q2 Answer: B

ACPE Universal Activity Number 121-999-11-488 -L05-P
Activity Type: Knowledge-based Contact Hours: 0.5
VALPROATE-INDUCED HYPERAMMONEMIA: CHARACTERIZATION OF PREDISPOSING FACTORS IN AN ADULT PSYCHIATRIC POPULATION

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PURPOSE: Valproic acid (VPA) has been shown to be an effective and generally safe agent for a variety of psychiatric conditions, especially bipolar disorder. However, the development of hyperammonemia (HA), with or without encephalopathy, is an established complication of this medication. Valproate-induced hyperammonemic encephalopathy (VHE) is characterized by acute changes in mental status and personality, lethargy, confusion, aggression, ataxia, gait disturbance and/or stupor. If left untreated, VHE can lead to coma or even death. Risk factors associated with VPA-induced HA and VHE have been suggested but are not well elucidated. Identification of such factors would be useful clinically. The purpose of this study is to characterize factors that predispose a VPA-treated patient to developing valproate-induced hyperammonemia.

METHODS: This retrospective chart review identified patients 18 years of age or older, admitted to any inpatient unit at Pine Rest Christian Mental Health Services from January 1, 2009 through July 1, 2010. Patients must have received treatment with VPA (or a derivative) and also have had a plasma ammonia level measured at some point during their admission. The following data were collected from 66 elevated ammonia patients and 29 normal ammonia patients (n = 95) using electronic medical records: patient demographic information; admitting laboratory studies; details specific to VPA therapy; alcohol use history; and characterization and quantification of concomitant medications. Comparisons of these data will be made between patients with hyperammonemia (Group I) and patients with normal ammonia levels (Group II). Nominal scale outcomes will be assessed using a Chi-square test, while continuous scale outcomes will be assessed with a student t-test. Additionally, correlation analysis will be conducted to investigate suspected relationships between variables.

RESULTS: Data collection and analysis is currently in progress.

CONCLUSIONS: To be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Describe the clinical manifestations of valproate-induced hyperammonemia and the risks associated with this condition.
Discuss factors that may contribute to the development of valproate-induced hyperammonemia.

Self Assessment Questions:
Which of the following statements is true about the clinical manifestations of hyperammonemia (HA)?
A. HA always presents with symptoms, such as mental status change
B. HA can only occur in the face of supra-therapeutic valproic acid level
C. VPA-induced HA often occurs in association with hepatic dysfunction
D. The severity of symptoms does not correlate with plasma VPA concentration

Which of the following mechanisms has been proposed as contributing to the development of valproate-induced hyperammonemia?
A. Inhibition of an enzyme involved in the urea cycle
B. Competitive plasma protein binding
C. Carnitine deficiency
D. All of the above

Q1 Answer: D Q2 Answer: D

EVALUATION AND STANDARDIZATION OF DRUG USE PROCEDURES THROUGHOUT THE CARDIAC CATHETERIZATION LABORATORIES IN A HEALTH CARE SYSTEM

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Purpose: Aurora Health Care is a health care system comprised of 15 hospitals, with seven of those hospitals providing cardiac cath lab services. The pharmaceutical services necessary for the medical care of these patients include safe medication storage and distribution, accurate resources for medication preparation and administration, and up-to-date drug information for health care providers. The purpose of this project was to standardize the pharmaceutical services throughout the Aurora Health Care cardiac catheterization laboratories.

Methods: Through surveys, interviews and observation of the cardiac cath labs of Aurora Health Care, current pharmacy services were tabulated and evaluated. Medication safety criteria for assessment were established based upon national guidelines, hospital policy and recommendations from the Institute for Safe Medication Practices. These criteria were assessed at each facility to determine drug safety targets for improvement. Results were reported to both cath lab and pharmacy managers to promote standardization. Differences in medication references were viewed at various facilities, and a single standard medication monograph format was presented for approval at all cath lab sites. A process was developed for creation, revision and approval of new or updated medication monographs. One drug use evaluation of antiplatelet and anticoagulant therapy in the cardiac cath labs was performed and compared against current guidelines and literature. Finally, continuing educational needs of cardiac cath lab staff were explored and a plan was developed for distribution of drug information.

Results/Conclusions: Data analysis is in progress; results and conclusions will be presented at Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Recognize the benefits of standardization of pharmacy practices in the cardiac catheterization laboratories.
Identify potential barriers to standardization across a health care system

Self Assessment Questions:
Which of the following is a benefit to standardization of pharmacy practices in the cardiac catheterization laboratories?
A. Increased medication use in the cath labs
B. Less pharmacist time spent in the cath labs
C. Increased medication safety in the cath labs
D. Decreased medication use in the cath labs

Which of the following is a barrier to standardization of cath lab pharmacy services across a health care system?
A. Development of system-wide cath lab policies and procedures
B. Integration of technology within the cath labs
C. Department members staffing more than one cath lab
D. Absence of a system cath lab department group

Q1 Answer: C Q2 Answer: D

ACPE Universal Activity Number 121-999-11-498 -L05-P
Activity Type: Knowledge-based Contact Hours: 0.5
CHRONIC ANTIBIOTIC SUPPRESSION IN OSTEOMYELITIS AND ASSOCIATED OUTCOMES IN A VETERANS POPULATION

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Purpose:
Optimal treatment for infections involving bone typically involves the removal of infected and necrotic tissue in conjunction with systemic antimicrobials. For various reasons, certain patients may be poor candidates for surgical intervention or undergo inadequate removal of all infected tissues. Various studies have demonstrated success in treating prosthetic joint infections with long-term antimicrobial suppression; however, data is scarce regarding patients with osteomyelitis and no foreign material. Furthermore, the ideal regimen and duration of therapy remains unclear for chronic suppressive therapies. The purpose of this study is to examine long-term antimicrobial suppression regimens used for patients with documented osteomyelitis in their abilities to achieve positive clinical outcomes and patient tolerability. Secondary purposes are to evaluate the time to normalization of laboratory biomarkers, cost-analysis of treatment regimens, and assess provider-based rationale for use of chronic suppressive therapy.

Methods:
Using electronic medical records, a retrospective chart review of all osteomyelitis patients treated with antimicrobial suppression regimens will be reviewed. Data pertaining to the treatment of infection and drug monitoring will be analyzed. Laboratory values may include data pertaining to renal function, liver function, complete blood count, and inflammatory biomarkers. Patient adverse reactions and hospitalization records will also be reviewed and standardized to collect and evaluate regimen outcomes.

Results/Conclusion:
Results and conclusions to be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Describe the rationale of chronic antibiotic suppression for patients with osteomyelitis.
Identify monitoring parameters of antibiotic suppression and the goals of therapy.

Self Assessment Questions:
The goal of chronic antibiotic suppression for patients with osteomyelitis is:
A: To prepare the patient for surgery or amputation.
B: To salvage the infected tissue or limb.
C: To prevent future infections after healing is complete.
D: To reduce the burden of bacterial colonization.

Which of the following statement is correct?
A: All patients treated for osteomyelitis require antibiotic suppression.
B: Inflammatory biomarkers and imaging studies are not useful in the
C: Antibiotic suppression remains the best option to treat osteomyelitis.
D: Antibiotic suppression has been shown to be beneficial for patients.

PHARMACIST MONITORING TO IMPROVE ANTIBIOTIC DISCONTINUATION RATES FOR THE SURGICAL CARE IMPROVEMENT PROJECT

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Background: The Surgical Care Improvement Project (SCIP) was initiated in 2003 to improve surgical care through the prevention of postoperative complications resulting in morbidity and mortality. A national goal was set to reduce preventable surgical morbidity and mortality 25% by 2010. One critical measure of SCIP is appropriate discontinuation of postsurgical antibiotics.

Purpose: The purpose of this study is to determine if daily pharmacist review of postoperative orders improves antibiotic discontinuation rates. Secondary aims include assessment of current compliance trends with SCIP and identification of potential barriers.

Methods: This is a prospective study that will assess adult patients undergoing surgery at Hillcrest Hospital October 1 through December 31, 2010. Subjects will be selected from a daily operating room master list. Patient profiles will be reviewed with an emphasis on postsurgical antibiotic selection, dose, and duration. Other collected data will include patient allergies, surgeon, type of procedure, requirement of pharmacy intervention, type of correction, and further actions.

Results and Conclusions: Data is being collected and analyzed. Final results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference in April 2011.

Learning Objectives:
Discuss the impact of pharmacist monitoring and interventions on compliance rates for postsurgical antibiotic discontinuation.
Identify potential barriers for compliance with the Surgical Care Improvement Project.

Self Assessment Questions:
SCIP is a national quality measure that is required for hospital accreditation by which organization?
A: JCAHO
B: CMS
C: CDC
D: AMA

Which type of surgical procedure does not require antibiotic discontinuation within 24 hours?
A: Hip/knee arthroplasty
B: Abdominal/vaginal hysterectomy
C: CABG
D: Vascular

Q1 Answer: A Q2 Answer: C

ACPE Universal Activity Number 121-999-11-369 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5
ANALYSIS OF SECONDARY MALIGNANCY IN MULTIPLE MYELOMA AFTER TREATMENT WITH IMMUNOMODULATORY AGENTS
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Purpose: Therapy for multiple myeloma includes steroids, chemotherapy, and autologous stem cell transplant. Lenalidomide and thalidomide are immunomodulatory agents (Imids) that have been shown to be useful for the initial and relapsed treatment of multiple myeloma. Secondary hematological malignancies have been observed with the use of alkylator therapy in lymphoma patients, the risk of secondary malignancy with Imid use is unknown. The purpose of this study is to assess the incidence of secondary solid tumor malignancy in the multiple myeloma population.

Methods: A retrospective chart review was conducted at the Indiana University Simon Cancer Center in Indianapolis, IN. Patients were greater than 18 years old, diagnosed with multiple myeloma and received active treatment. Exclusion criteria included patients with a prior history of malignancy predating multiple myeloma.

Patients were stratified into two groups: those who developed a secondary malignancy and those who did not. Patients who developed a secondary malignancy were assessed for treatment history, location and type of malignancy. Data points included: age, gender, tobacco use, stage and type of myeloma at diagnosis, and treatment history.

Endpoints: The primary objective was to assess the incidence of secondary solid tumor malignancy in the multiple myeloma population. Secondary objectives included: incidence of secondary malignancy in patients who received Imid therapy to patients not exposed to Imid treatment; assessment of the type of malignancy that developed; and finally, evaluate the time from treatment of myeloma to development of a secondary malignancy.

Results/Conclusion: To be discussed upon completion of data collection

Learning Objectives:
Identify appropriate treatment option in multiple myeloma.
Describe the incidence of secondary malignancy.

Self Assessment Questions:
Which of the following agents is not an accepted Multiple Myeloma treatment?
A Melphalan
B Autologous Stem Cell Transplant
C Thalidomide
D Allogeneic Stem Cell Transplant

Which of the following is considered to be an immunomodulator?
A Melphalan
B Bortezomib
C Lenalidomide
D Azathioprine

Q1 Answer: D Q2 Answer: C

ACPE Universal Activity Number 121-999-11-103 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

ESTABLISHMENT OF AN INTRAVENOUS IMMUNOGLOBULIN (IVIG) UTILIZATION MANAGEMENT PROGRAM AT AN ACADEMIC MEDICAL CENTER
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Purpose: Intravenous immunoglobulin (IVIG) has become an important treatment option for a wide range of medical conditions beyond the traditional use in immune deficiencies. The utilization of IVIG has increased to over 100 non-FDA approved indications and has expanded into many clinical practice areas. The increase in utilization at University of Wisconsin Hospital and Clinics (UWHC) has made IVIG the number one drug expense for UWHC in both the inpatient and clinic setting. Given the wide variety of indications for use documented in the literature the overall increase in utilization at UWHC and the significant budget impact associated with this use, the department of pharmacy has identified a need for an IVIG utilization management program. The goal of the IVIG utilization management program is to ensure appropriate, safe, and cost-effective use of IVIG at UWHC.

Methods: Prior to commencement of the project, IRB approval was obtained. A retrospective review of 24 months of IVIG utilization at UWHC was conducted. The IVIG utilization management program was implemented in two phases. In phase one, a task force containing the primary stakeholders was created. The primary stakeholders include key physicians in the medical services that were identified as the top prescribers of IVIG, department chairs, and pharmacists. The task force was charged with developing consensus about appropriate uses of IVIG endorsing the Pharmacy & Therapeutics committee approved IVIG guidelines, and creating a process for implementing and monitoring the adherence of the guidelines. Phase two consisted of developing a strategy for guideline implementation. This encompassed defining a mechanism to track appropriate utilization over time, quantifying the impact of the IVIG guidelines, defining measurable outcomes, and lastly improving reimbursement strategies by facilitating appropriate documentation.

Results: Data analysis and conclusion will be presented at the Great Lakes Conference in April.

Learning Objectives:
Explain the strategies in implementing an IVIG utilization management program and list the steps involved in developing consensus on appropriate uses and approval of the IVIG guidelines at UWHC.
Outline the process for ongoing monitoring of and adherence to the guidelines, report the predicted impact of the revised IVIG utilization guidelines for both pediatrics and adults on cost savings and avoidance.

Self Assessment Questions:
Identify a strategy that can be used to manage high-cost administered medications?
A Develop a task force with just pharmacist
B Revise guidelines to reflect expert opinion only
C Compare medication utilization trends to the literature
D Analyze only current utilization

Establishing a task force would most likely facilitate which of the following
A Appropriate, safe, and cost-effective use
B A positive impact on the pharmacy budget
C A decrease in utilization
D A disconnect amongst providers and pharmacists

Q1 Answer: C Q2 Answer: A

ACPE Universal Activity Number 121-999-11-085 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
USE OF AN ELECTRONIC MEDICAL RECORD TO IMPROVE STANDARD PRACTICE IN THE PRIMARY CARE SETTING: A PILOT STUDY OF HERPES ZOSTER VACCINATION RATES

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Purpose: To 1) Investigate if the capability of an electronic medical record (EMR), in combination with a pharmacist as part of the care team can improve the herpes zoster vaccination rate and 2) Determine if a difference is detected in response rates for patients receiving standard mail versus electronic mail communication.

Methods: The EMR will generate a list of patients managed at an academic general internal medicine clinic aged 60 or older without documentation of the herpes zoster vaccine. Patients will be prospectively randomized to a control or intervention group. Intervention group patients will receive an email through a secure electronic portal or a letter through US Postal Service mail explaining potential benefits of the herpes zoster vaccine. Interested patients will contact the clinic to have a pharmacist review the medical chart to assess if the herpes zoster vaccine is clinically indicated; eligible patients will be mailed a herpes zoster vaccination prescription. Without confirmation of administration from the pharmacy, patients will receive a follow-up phone call 30 days after the written prescription date inquiring if they received the herpes zoster vaccine.

Results: To see an 8% difference between the intervention group and the control group, a total sample size of 166 patients per group will be needed. After a 6-month period, the proportion of subjects receiving this vaccine in the intervention and control groups will be compared by a chi-square test at the α=0.05 significance level; Results are pending.

Conclusions: We postulate results of this study will validate a new and effective way to promote health, prevent disease, and improve health care decision making for both patients and providers.

Learning Objectives:
Discuss the opportunities for a pharmacist as part of the care team.
Describe how health care teams can use the electronic medical record to improve primary prevention measures and enhance overall health care.

Self Assessment Questions:
A lack of emphasis on preventive medicine in the primary care setting results partially from:
A Including a new healthcare model that uses a team of care givers
B Full health insurance coverage
C Inadequate database retrieval systems
D Maximum reimbursement rates

Which of the following is a benefit of an EMR:
A Access to patient information is difficult
B Improves safety
C Decreases collaboration between health care providers
D Delays workflow

Q1 Answer: C  Q2 Answer: B

PHARMACISTS ROLE IN REDUCING HEART FAILURE READMISSION RATES IN THE VETERANS AFFAIRS SYSTEM: PART II

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PURPOSE:
Effective communication and education is essential for managing patients who have experienced recent hospitalizations for heart failure exacerbations. The percentage of hospitalizations that are contributed by medication and dietary non-compliance is significant. The purpose of this study was to evaluate the effect of disease and dietary education via phone by a pharmacist on the rates of heart failure readmission.

METHODS:
Patients who were discharged with a primary diagnosis of heart failure between the periods of August 20, 2010 to January 7, 2011 were identified for pharmacist follow-up via phone. Patients were contacted after discharge every 2 weeks for a total of 3 calls. Predesigned questions were asked of each patient and the same questions were asked at each of the 3 calls. The questions included whether patients performed daily weights, if they knew who to contact for rapid weight increases, practices to limit dietary salt intake, typical amount of daily fluid intake, and medication compliance. Patients knowledge of activities related to home maintenance of heart failure was evaluated.

Patients were provided additional education about heart failure over the phone and supplementary pamphlets were mailed to provide written education. Scales, pillboxes, or blood pressure monitors were mailed to patients that did not have these items. In additions to the predefined questions, follow-up was performed on the supplemental written material. A retrospective chart review will be performed on patients that received phone follow-up to evaluate the effectiveness of the pharmacist intervention on heart failure readmission rates in 6 months. Descriptive statistics will be performed to assess the effectiveness of pharmacist interventions on reducing rates of heart failure patients.

RESULTS:
Results will be presented on the information obtained from the analysis of the phone questionnaire.

CONCLUSION:
Conclusions will be presented on the patients ability to interpret instruction from discharge and apply to home management of heart failure.

Learning Objectives:
Describe the benefits provided to patients on limiting salt intake, fluid restriction, and medication compliance.
List the essential tools patients need at time of discharge to perform effective home management of heart failure.

Self Assessment Questions:
Which of the following statements is correct?
A Heart failure patients should receive written and verbal education on dietary restriction and medication compliance.
B Patients should not be instructed on how much fluid they consume.
C The importance of medication compliance should be explained to patients.
D Both A and C

What items should a heart failure patient receive prior to hospital discharge?
A Scale to weigh themselves
B Dietary education
C Pill box
D All of the above

Q1 Answer: D  Q2 Answer: D

ACPE Universal Activity Number 121-999-11-137 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
ASSESSMENT OF A PILOT PHARMACY VANCOMYCIN DOSING SERVICE

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Background: Research comparing pharmacist-run therapeutic drug monitoring services for vancomycin to standard care have shown decreases in vancomycin-related renal insufficiency, duration of vancomycin use, and serum concentrations measured without a difference in cure rates or clinical improvement. In an effort to optimize the quality of care provided to patients, Cleveland Clinic Department of Pharmacy instituted a pilot vancomycin dosing service for internal medicine patients.

Methodology: A non-interventional, retrospective, chart review to evaluate the number of vancomycin levels drawn per patient and proportion of vancomycin levels within goal range between a pharmacy vancomycin dosing service (post-group) vs. usual care group (pre-group). Secondary endpoints include evaluating accuracy of timing of pre-dose vancomycin levels relative to dose administered and physician satisfaction with the pharmacy vancomycin dosing service. All patients 18 years of age or older, admitted to one of three internal medicine teaching services, and initiated on vancomycin will be included. Exclusion criteria includes patients in the post-group who receive vancomycin but are not consulted to the pharmacy vancomycin dosing service. The timeframe includes June 1 to July 31, 2010 for the pre-group and September 1 to October 31, 2010 for the post-group. Data describing patient demographics, vancomycin medication records, and vancomycin serum levels will be collected. An alpha of less than 0.05 will be considered statistically significant. A t-test will be used to evaluate continuous data and a chi-squared test will be used to evaluate categorical data.

Results: To be presented.

Learning Objectives:
Describe the pharmacists role in managing the vancomycin dosing service.
Outline the research design and methods.

Self Assessment Questions:
The pharmacists managing the vancomycin dosing service are responsible for which of the following activities?
A Ordering the first dose of vancomycin
B Managing vancomycin dose adjustments and serum level monitoring
C Determining the goal vancomycin trough concentration
D Selecting the indication for and duration of vancomycin use

The design of the current research is a:
A Randomized controlled trial
B Case-control study
C Cross-sectional study
D Retrospective chart review

Q1 Answer: B Q2 Answer: D

ACPE Universal Activity Number 421-999-11-133 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

A RETROSPECTIVE REVIEW OF THE OFF-LABEL USE OF ACTIVATED RECOMBINANT FACTOR VII AT A TERTIARY CARE CENTER

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Purpose: Recombinant activated factor VII (rFVIIa, NovoSeven RT) is a prohemostatic agent with increasing off-label use in a wide range of conditions. To date, there have been few randomized controlled trials to guide its dosing and administration or confirming its safety and efficacy when used off-label. The purpose of this study was to describe the clinical practice and to review the efficacy, safety, and institutional drug cost of off-label rFVIIa use at Borgess Medical Center, a community tertiary care center.

Methods: Electronic medical records were retrospectively reviewed in patients over the age of 18 who had received at least one dose of rFVIIa between January 1st, 2007 and January 1st, 2011. Pregnant patients, obstetric patients, and patients who had a documented FDA approved indication for rFVIIa were excluded from the study. The baseline data collected included patient demographics, indication for rFVIIa use, dose of rFVIIa, exacerbating medications, baseline coagulation and hematology lab values, vital signs, and use of additional hemostatic agents. Following data collection, patients were stratified into groups based on indication for use. Outcomes evaluated included blood product use 24 hours prior to and after rFVIIa dose, thromboembolic adverse events, ICU length of stay, hospital length of stay, institutional drug cost, and mortality at time of hospital discharge.

Results/Conclusion: Analysis of results is ongoing. Results and conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:
Identify the off-label uses for recombinant activated factor VII.
Discuss the various types of thromboembolic events associated with off-label recombinant activated factor VII use.

Self Assessment Questions:
Which of the following is an FDA approved indication for the use of recombinant activated factor VII?
A Acquired factor VIII deficiency
B Intracerebral hemorrhage
C Procedural bleeding prophylaxis
D Oral vitamin K antagonist reversal

Which of the following is an arterial thromboembolic adverse event associated with off-label recombinant activated factor VII use?
A Deep Venous Thrombosis (DVT)
B Pulmonary Embolism (PE)
C Acute coronary syndrome (ACS)
D Thrombophlebitis

Q1 Answer: A Q2 Answer: C

ACPE Universal Activity Number 121-999-11-256 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
When used for maintenance immunosuppression regimens, how is no longer available in the United States? Of the drugs listed below, which is an Interleukin-2 receptor antagonist antagonists can be used for maintenance immunosuppression. Identify the appropriate population where Interleukin-2 receptor maintenance regimens for post-transplant immunosuppression.

Learning Objectives:
- Describe the rationale for use of Interleukin-2 receptor antagonists in maintenance regimens for post-transplant immunosuppression.
- Identify the appropriate population where Interleukin-2 receptor antagonists can be used for maintenance immunosuppression.

Self Assessment Questions:
- Of the drugs listed below, which is an Interleukin-2 receptor antagonist and is no longer available in the United States?
  - A: Basiliximab
  - B: Daclizumab
  - C: Etanercept
  - D: Imatinib

When used for maintenance immunosuppression regimens, how frequently were IL-2RA infusions dosed in our patient population?
- A: Daily
- B: Weekly
- C: Monthly
- D: Every 3 months

Q1 Answer: B  Q2 Answer: C
EVALUATION OF GASTROINTESTINAL BLEEDING IN VETERANS ON TRIPLE ANTITHROMBOTIC THERAPY

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Background: Triple antithrombotic therapy with warfarin, aspirin, and clopidogrel is becoming more common as patients present with indications for both anticoagulant and antiplatelet therapies. The most common complication associated with antithrombotic therapy is bleeding, particularly gastrointestinal (GI) bleeding. A greater concern for bleeding in patients on triple antithrombotic therapy has many clinicians prescribing proton pump inhibitors (PPI) and histamine-2-receptor antagonists (H2RA) concomitantly as a strategy to reduce bleeding. Studies evaluating GI prophylaxis in patients on triple antithrombotic therapy are limited. However, utilization of GI prophylaxis in this setting is high and triple therapy is becoming more common. Guidelines on the routine use of GI prophylaxis in patients on triple antithrombotic therapy are controversial and should be further evaluated.

Methods: This study was a retrospective electronic chart review of patients 18 years and older and on concurrent triple antithrombotic therapy with warfarin, aspirin, and clopidogrel and either PPI, H2RA or no GI prophylaxis.

Purpose: This study is designed to determine the incidence of GI bleeding in Jesse Brown VA Medical Center (JVBAMC) patients on triple antithrombotic therapy with warfarin, aspirin, and clopidogrel or either PPI, H2RA or no GI prophylaxis.

Results/Conclusion: Data collection is in progress; results and conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:
Recognize the risk of GI bleeding in patients on triple antithrombotic therapy.
Discuss potential methods to reduce the risk of GI bleeding in patients on triple antithrombotic therapy.

Self Assessment Questions:
What is the most common complication of antithrombotic therapy?
A: Gastrointestinal bleeding
B: Diarrhea
C: Thrombosis
D: Thrombocytopenia

According to the CHEST guidelines, what is the recommended target INR for a patient on triple antithrombotic therapy?
A: 1.0-2.0
B: 2.0-3.0
C: 2.0-2.5
D: 2.5-3.0

IMPLEMENTING EHR CLINICAL DECISION SUPPORT MONITORING TOOLS FOR PHARMACISTS IN NEONATAL INTENSIVE CARE UNIT

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Purpose: The purpose of this study is to develop, implement and evaluate an electronic health record (EHR) clinical decision support tool for pharmacist monitoring of the neonatal population. The goal is to utilize the functionality available in the EHR to direct relevant clinical information to the pharmacist. This process will streamline clinical monitoring and eliminate extraneous documentation on paper monitoring forms.

Methods: An initial evaluation of the neonatal intensive care unit (NICU) pharmacists workflow will determine the most common neonatal monitoring parameters. A system within the EHR will be developed and implemented to prioritize patient assessment and monitoring for pharmacists. A retrospective review comparing pre- and post-implementation data will be performed. The objectives to be assessed include: magnesium monitoring for patients on total parenteral nutrition (TPN), baseline LFT monitoring for patients on defined antimicrobial agents, and theophylline level monitoring for patients on aminophylline or theophylline.

Results: IRB evaluation is ongoing. Upon IRB approval data collection will begin. Results and conclusions will be presented at the conference.

Learning Objectives:
Indicate specific clinical parameters that a NICU pharmacist monitors.
Discuss the advantages and limitations of the neonatal-specific clinical decision support technology.

Self Assessment Questions:
The developed neonatal-specific clinical decision support system can aid pharmacists with which of the following medication therapy monitoring?
A: Theophylline
B: Vancomycin
C: Clonidine
D: Both A and B

The use of neonatal-specific clinical decision support tools reduces the need for which of the following?
A: Daily pharmacist monitoring
B: Pharmacist and physician communication
C: Documentation on paper monitoring forms
D: Both A and B

Q1 Answer: D Q2 Answer: C

ACPE Universal Activity Number 121-999-11-378 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5
ESTABLISHING CLINICAL PHARMACY SERVICES IN THE EMERGENCY DEPARTMENT: BUSINESS CASE PROPOSAL
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Background/Purpose
There have been numerous studies which show that the ED has the highest rate of preventable adverse events among clinical environments studied. Having one of the busiest ERs in the Milwaukee area, serving approximately 296,000 patients last year, implementing a clinical pharmacy program would be both cost effective and provide a positive impact on patient care. ED clinical pharmacists would have a variety of responsibilities which include but are not limited to providing medication reconciliations for admitted patients, prospective review of physician orders, discharge counseling, providing evidence-based recommendations, participating in team rounds, recommending alternative drug therapies, monitoring drug interactions, etc. Addressing medication related questions or problems at the beginning of their visit can help decrease hospital associated complications and improve our cost savings.

Methods
A pilot study was developed and initiated by a PGY-1 resident to assess the need for a clinical pharmacist in the emergency department at St. Josephs Hospital. Data was gathered for 3 weeks to identify areas in which an onsite pharmacist could improve patient care and reduce cost. The ED staff utilized pharmacy presence by asking drug information questions, including but not limited to, medication dosing, appropriate antimicrobial therapy, toxicology, compatibility, etc. Other interventions made by pharmacy included responding to codes, providing education to the ED staff, making recommendations to optimize drug therapy, and to ultimately be available for any assistance required.

Results
Presence of a pharmacist in the emergency department was appreciated and utilized. Positive impact on patient care, reduced medication errors provided optimal medication administration time, and stressed collaborative practice in an acute care setting. Cost savings analysis is still being evaluated and these results along with the conclusion will be ultimately be available for any assistance required.

Learning Objectives:
Outline the roles and responsibilities of the clinical pharmacist and assess requirements necessary for a pharmacist to qualify for this position.
Describe the value of an ED clinical pharmacist and discuss optimal cost savings in order to support such a position.

Self Assessment Questions:
The main role an ED pharmacist will play is to
A: serve as a medicine reconciliation pharmacist
B: serve as a glorified technician.
C: serve as a primary resource for medication related questions.
D: serve as an order entry pharmacist.

What is one way an ED pharmacist can improve patient care?
A: Decrease drug related errors.
B: Start IV lines for busy nurses.
C: Dispense medications to patients.
D: Call in new prescriptions to retail pharmacies.

Q1 Answer: C  Q2 Answer: A

ACPE Universal Activity Number 121-999-11-384 -L04-P
Activity Type: Knowledge-based  Contact Hours: 0.5

PHARMACOKINETIC EVALUATION OF AN ANTIBIOTIC PROPHYLAXIS REGIMEN FOR CORONARY ARTERY BYPASS GRAFT
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PURPOSE: During coronary artery bypass graft (CABG) surgery, drug concentrations may decline drastically due to pharmacokinetic changes as a result of the cardiopulmonary bypass (CPB) machine. There is limited research on the potential degree of decline of antibiotic concentrations that may occur due to the CPB machine. The primary purpose of this study is to determine the effect of the CPB machine on serum antibiotic concentrations. The secondary objective is to verify that the current peri-operative antibiotic regimen at a tertiary care community hospital maintains adequate concentration throughout the surgical procedure.

METHODS: This is an IRB approved prospective study funded by the St. Vincent Foundation. Inclusion criteria include subjects age 18 years or older who are admitted to St. Vincent Indianapolis Hospital or St. Vincent Heart Center of Indiana from January 2011 to April 2011 for elective CABG surgery (defined as scheduled at least 48 hours prior). Subjects with active infection, residing in a long-term care facility or hospitalized greater than 5 days prior to surgery, emergent cases, CrCl < 30 mL/min or AST or ALT > 3x the upper limit of normal will be excluded from this study. All patients enrolled in the study will receive the standard pre-operative prophylactic antibiotic regimen of 1.5 grams of cefuroxime as a single intravenous dose within 1 hour before the first surgical incision. Serum antibiotic levels will be obtained immediately before the start of the CPB machine, 30 minutes after the start of the CPB machine, and immediately after the CPB machine is turned off to assess potential serum concentration changes.

RESULTS & CONCLUSIONS: This project is in the data collection phase. Results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Recognize the importance of appropriate surgical prophylaxis for CABG surgery and the concern associated with low serum antibiotic concentrations.
Discuss the impact of the CPB machine on serum antibiotic concentrations.

Self Assessment Questions:
Which of the following is the gold standard when it comes to meeting Joint Commission surgical prophylaxis measures?
A: American Society of Health System Pharmacists
B: Surgical Care Improvement Project
C: Medical Letter
D: American Academy of Family Physicians

Which of the following are risks associated with inadequate surgical prophylaxis in CABG surgeries?
A: Sternal wound infection
B: Bacterial resistance
C: Antibiotic toxicity
D: A & B

Q1 Answer: B  Q2 Answer: D

ACPE Universal Activity Number 121-999-11-282 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
IMPACT ON PROTON PUMP INHIBITOR USE POST-TEMPLATE IMPLEMENTATION IN THE VETERAN POPULATION

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Purpose: The primary purpose of this study is to evaluate the use of proton pump inhibitors (PPIs) on the general medicine floor of the Edward Hines, Jr. VA Hospital before and after implementing a PPI template. Proton pump inhibitor use can cause malabsorption of acid-dependent nutrients and drug interactions. In addition, PPIs have been associated with hospital and community acquired pneumonia, Clostridium difficile, and osteoporosis.

Methods: This is a retrospective chart review of 200 patients admitted to the general medicine floor. Patients included had to be at least 18 years of age, must have received at least one dose of a PPI during their hospitalization, and must have been discharged from the general medicine floor. Pregnant patients were excluded from this study. A PPI template was implemented in February 2011 which contained indications for PPIs along with normal dose, route, frequency and duration of therapy. The primary outcome is to compare the percentage of patients who have no indication for a proton pump inhibitor before versus after implementation of the template on the general medicine floor. Secondary outcomes include the number of patients who were inappropriately discharged on a PPI and the estimated cost associated with continuation of the PPI based on discharge dose, frequency, and number of refills.

Learning Objectives:
Identify potential side effects associated with long-term use of proton pump inhibitors.
Recognize appropriate indications of proton pump inhibitors.

Self Assessment Questions:
Which of the following are potential long-term side effects of proton pump inhibitors?
A Clostridium difficile
B Urinary tract infections
C Cough
D Renal insufficiency

Which of the following is an appropriate indication for starting a proton pump inhibitor in a patient?
A The patient is taking a proton pump inhibitor at home
B The patient has new onset peptic ulcer disease
C The patient is admitted to the general medicine floor
D The patient is taking a proton pump inhibitor at home

Q1 Answer: A  Q2 Answer: B

ACPE Universal Activity Number 121-999-11-460 -L05-P
Activity Type: Knowledge-based Contact Hours: 0.5

ANTICOAGULATION MANAGEMENT IN CANCER PATIENTS WITH THROMBOCYTOPENIA

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Background: Patients with cancer are four to seven fold higher risk for venous thromboembolism (VTE) when compared to patients without cancer. Cancer patients often experience thrombocytopenia due to chemotherapy or underlying disease associated with bone marrow suppression. Anticoagulation in cancer patients with different grades of thrombocytopenia is a great challenge, especially platelet count less than 50,000, which is a contraindication for the use of anticoagulation due to the high risk of bleeding. There is limited data to provide guidance regarding the use of anticoagulation for treatment of acute VTE, high risk atrial fibrillation/flutter, and heart valve replacement in patients with thrombocytopenia. The objectives of this study are to evaluate the safety and efficacy outcomes of therapeutic dose low molecular weight heparin fondaparinux, heparin, and warfarin in cancer patients through various grades of thrombocytopenia.

Methods: Retrospective review of health systems electronic medical record between January 2009 to August 2010 will be conducted to determine patients who are receiving cancer treatment and therapeutic doses of low molecular weight heparin, fondaparinux, heparin, or warfarin. Patients included will be divided into groups based on the grade of thrombocytopenia. Data will be collected to include cancer type, indication for anticoagulation, and continuation or discontinuation of anticoagulation while experiencing thrombocytopenia. The type thrombotic events and major bleeds while on or off anticoagulation during different grades of thrombocytopenia will be noted. The data collected will be evaluated to determine the grade of thrombocytopenia at which anticoagulation can be safely held without increasing risk of thrombotic events or major bleeding events.

Results/Conclusions:
Results and conclusions will be presented at the 2011 Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Discuss current guideline based recommendations for anticoagulation in cancer patients with thrombocytopenia.
Recognize the risk of thrombosis while holding anticoagulation or bleeding while continuing anticoagulation during various grades of thrombocytopenia based on study results.

Self Assessment Questions:
What is/are the most likely cause(s) for development of thrombocytopenia in cancer patients?
A Chemotherapy and disease associated bone marrow suppression
B Infection and antibiotics
C Colony Stimulating Growth Factor
D Anticoagulation

Current ASCO guidelines recommend anticoagulation be discontinued when platelets are:
A 150,000
B 100,000
C 75,000
D < 50,000

Q1 Answer: A  Q2 Answer: D

ACPE Universal Activity Number 121-999-11-242 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
Which of the following statements is correct?

A: Abnormalities of the urinary tract
B: Female gender
C: Urinary catheterization
D: Previous treatment with fluoroquinolone

Which of the following statements is correct?

A: Catheter-associated bacteriuria accounts for approximately 5% of UTIs.
B: Limiting the use and duration of urinary catheters can result in significant reductions of catheter-associated UTIs.
C: A discharge diagnosis of catheter-associated UTI is not likely to be correct.
D: Urinary catheterization is not generally related to the development of resistance.

Q1 Answer: B  Q2 Answer: B

EVALUATION OF EMPIRIC ANTIMICROBIAL TREATMENT FOR URINARY TRACT INFECTIONS

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Purpose: Urinary microorganisms are becoming increasingly resistant to antimicrobials, particularly ciprofloxacin-resistant E. coli. At this 250-bec hospital, E. coli resistance rates unspecific to uropathogens in 2009 were 31% for trimethoprim-sulfamethoxazole (TMP-SMX) and 47% for ciprofloxacin. The primary outcome is to define resistance rates among uropathogens, which will assist in determining the hospitals empiric antimicrobial guidelines for UTIs. This study will also examine if empiric antibiotics, and any change in antibiotics, were appropriate based on susceptibility results.

Methods: A retrospective cohort study exempt from IRB review was conducted. The hospitals electronic medical records were used to randomly include 100 positive urine cultures from 2010. Patients were excluded if urine cultures were <100,000 CFU, patient <18 years old, negative urine analysis (UA) or no UA performed, fungal or >2 organisms, and dialysis patients. Demographics included age, gender, length of stay, type of UTI, history of UTI, home or skilled nursing facility recent hospitalization and recent antibiotics, other infectious diseases, symptoms of UTI, urine culture results, susceptibilities, presence of extended-spectrum beta-lactamase producing organism, urinary catheterization, empiric antibiotic and change in antibiotic based on susceptibilities, ID consult, appropriateness of antibiotic use, and treatment duration.

Results: 224 urine cultures were reviewed to reach the 100 included. The top uropathogens included E. coli (52.7%), Klebsiella pneumoniae (9.1%) and Proteus mirabilis (7.3%). E. coli had highest resistance to ampicillin (48.3%), ciprofloxacin (31%) and TMP-SMX (22.5%). Commonly prescribed antibiotics were ciprofloxacin (41%) and piperacillin-tazobactam (23%). Risk factors for the 18 ciprofloxacin-resistant E. coli included age > 65 years old (83.3%), past medical history of UTI (61.1%), prior ciprofloxacin within 30 days (27.8%) and urinary catheterization (22.2%). Catheter-associated UTIs comprised 27% of all patients.

Conclusion: Data from 2009 and 2010 reveal higher rates of ciprofloxacin resistance than TMP-SMX for E. coli. These results will help guide the hospitals empiric antimicrobial recommendations for UTIs.

LEARNING OBJECTIVES:
Recognize the need to review changes in resistance patterns among uropathogens.
Describe an institutional-based approach to evaluating empiric prescribing patterns for UTIs.

SELF ASSESSMENT QUESTIONS:
Risk factors for ciprofloxacin-resistant E. coli include all of the following except:
A. Abnormalities of the urinary tract
B. Female gender
C. Urinary catheterization
D. Previous treatment with fluoroquinolone

What should the immunosuppressant dose reduction be for a patient taking sirolimus and tacrolimus with an azole concurrently for GVHD and IFI prophylactic therapy?

A: 25% dose reduction
B: 33% dose reduction
C: 50% dose reduction
D: Depends on the azole agent

Q1 Answer: B  Q2 Answer: B

DEVELOPMENT OF A DOSING ALGORITHM FOR CONCOMITANT ADMINISTRATION OF TACROLIMUS, SIROLIMUS, AND AN AZOLE AFTER ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Purpose: Recent literature has shown the combination of tacrolimus and sirolimus to be an effective immunosuppressive regimen as prophylaxis for graft-versus-host disease (GVHD) in allogeneic hematopoietic stem cell transplantation (allo-HSCT). Patients undergoing allo-HSCT have a high incidence of invasive fungal infections (IFIs) secondary to prolonged periods of neutropenia. Prophylaxis with azole agents is common practice; however, simultaneous use of the aforementioned agents results in significant pharmacokinetic interactions and potential for drug toxicities. Current literature addresses the use of azoles with tacrolimus or sirolimus as individual agents, but the literature does not address dosage adjustments when using tacrolimus, sirolimus, and an azole concurrently for GVHD and IFI prophylactic therapy. The objective of this study is to construct a dosing algorithm for concomitant use of immunosuppression and azole antifungal therapy for the prophylaxis of GVHD and IFIs for patients undergoing allo-HSCT.

Methods: This retrospective study identified hospitalized patients who underwent allo-HSCT between August 2009 and November 2010. From this group, patients who underwent concurrent tacrolimus, sirolimus, and an azole therapy were included for evaluation. The electronic medical record system at RUMC was used to collect data, including: patient age, gender, ethnicity, height, weight, hemato logic malignancy, stem cell donor type, serum creatinine, hepatic function, initiation day of prophylactic therapy, azole regimen, and use of other concurrent interacting medications. In regards to tacrolimus and sirolimus, data collection focused on serum trough concentrations and initial and discharge doses. This information is being used to determine the magnitude of change in immunosuppression dosing in conjunction with azole use from initiation to discharge and analyzed to develop a dosing algorithm dependent on whether fluconazole, posaconazole, or voriconazole is used.

Results/Conclusions: Data collection and analysis are in progress and will be presented at the Great Lakes Pharmacy Resident Conference.

LEARNING OBJECTIVES:
Discuss the potential pathways of interaction between sirolimus, tacrolimus, and azole antifungal agents.
Identify the magnitude of immunosuppressant dose reduction when using sirolimus and tacrolimus with an azole concurrently for GVHD and IFI prophylactic therapy.

SELF ASSESSMENT QUESTIONS:
Which of the following cytochrome P450 (CYP) isoenzymes is a pathway of interaction between sirolimus, tacrolimus, and azole antifungal agents?

A: CYP2D6
B: CYP3A4
C: CYP2E1
D: CYP2C9

What should the immunosuppressant dose reduction be for a patient taking sirolimus and tacrolimus combined with either fluconazole, posaconazole, or voriconazole?

A: 25% dose reduction
B: 33% dose reduction
C: 50% dose reduction
D: Depends on the azole agent

Q1 Answer: B  Q2 Answer: D

ACPE Universal Activity Number 121-999-11-297 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5

ACPE Universal Activity Number 121-999-11-301 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
EVALUATION OF THE EFFICACY OF COMMONLY-PRESCRIBED AGENTS FOR THE MANAGEMENT OF CHRONIC INSOMNIA IN ADULTS.

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Purpose: The purpose of this study is to evaluate the efficacy of various medications comprising the primary care outpatient algorithm for treatment of chronic insomnia, defined as sleeplessness symptoms persisting greater than one month. Despite the accepted use of non-benzodiazepine receptor agonists, antidepressants, antihistamines, and atypical antipsychotics, comparative efficacy data is lacking. Additionally, this research will examine safety endpoints associated with the use of these agents. Understanding of these endpoints may allow for targeted interventions, such as the development of an updated treatment algorithm to reflect study findings, which can be formulated to assist in the enhancement of sleep disorder management at the Huntington Veterans Affairs Medical Center (HVAMC).

Methods: A retrospective chart review of patients receiving outpatient treatment of chronic insomnia at the HVAMC with documented trials of different classes of insomnia agents will be performed. To minimize the potential for confounders related to inter-patient variability, patients included will consist of only those treated with at least one agent from each treatment group. Treatment will be stratified as follows: (1) antihistamines (diphenhydramine, hydroxyzine, doxepin); (2) benzodiazepine/non-benzodiazepine receptor agonist/sedating antidepressants (temazepam, zolpidem, mirtazapine, trazodone); (3) atypical antipsychotic (quetiapine).

The primary endpoint, evaluation of efficacy, will be defined as time to treatment agent change. This will be calculated for each group and values compared. Comparison of the primary endpoint will serve to evaluate relative efficacy of treatment groups. The secondary endpoint, an assessment of safety, will include mean change in Body Mass Index (BMI) from baseline; documented adverse drug reactions to therapy; and in patients with a diagnosis of diabetes mellitus and Hemoglobin A1c of less than 8.0%; mean change in hemoglobin A1c from baseline and increase in intensity of diabetes pharmacotherapy.

Results: Results are pending final data collection and analysis.

Learning Objectives:
Identify classes of medications commonly prescribed for the management of chronic insomnia in adults.
Discuss the mechanisms of action, safety, and efficacy of insomnia agents as well as patient-specific considerations that influence medication selection.

Self Assessment Questions:
Which of the following, per package insert, should be monitored periodically in all patients initiated on quetiapine therapy?
A Complete blood count
B Liver function tests
C Body weight
D BUN/SCR

Which of the agents below is FDA-approved for treatment of insomnia?
A Trazodone
B Quetiapine
C Doxepin
D Temazepam

Q1 Answer: C Q2 Answer: D

ACPE Universal Activity Number 121-999-11-173 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

A RETROSPECTIVE COMPARISON OF METHICILLIN-SUSCEPTIBLE STAPHYLOCOCCUS AUREUS (MSSA) AND METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS (MRSA) OUTCOMES IN HOSPITALIZED PATIENTS WITH BLOODSTREAM INFECTIONS

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Purpose: Staphylococcus aureus is the leading cause of bacteremia and is associated with high mortality rates, reportedly up to 60% in some hospital settings. Methicillin-resistant S. aureus (MRSA) is a growing problem both in the community and in the hospital setting and can account for over half of all nosocomial infections in intensive-care units (ICU). Multi-drug resistant organisms can increase mortality, morbidity, and result in longer hospital lengths of stay. Several studies have been conducted to determine whether there are any specific differences in these clinical outcomes when comparing methicillin-susceptible S. aureus (MSSA) to MRSA bacteremia. Unfortunately, the results of these studies are not definitive. Vancomycin continues to be the mainstay of treatment in patients with MRSA bacteremia despite emergence of newer agents. There are also increasing reports of vancomycin treatment failures for MRSA isolates with a susceptible minimum inhibitory concentration (MIC) value (MIC < 2 mcg/mL per Clinical Laboratory Standards Institute). The purpose of this study is to evaluate and characterize outcomes of hospitalized bacteremic patients with methicillin-resistant Staphylococcus aureus (MRSA) compared to methicillin-susceptible Staphylococcus aureus (MSSA) and to evaluate the relationship of patient outcomes to initial vancomycin trough concentrations and vancomycin MICs.

Methods:
Retrospective cohort study conducted among all adult patients with documented S. aureus bacteremia at Indiana University Hospital and Methodist Hospital. Exclusions included patients aged < 18 years old, concomitant polymicrobial infection in bloodstream, duration of scheduled vancomycin therapy < 72 hours, length of hospital stay for encounter < 48 hours. Primary outcomes included all-cause mortality, total hospital length of stay and duration of bacteremia.

Results and Conclusions:
Data collection currently in progress. Results and conclusions will be presented at the Great Lakes Pharmacy Residency conference.

Learning Objectives:
Identify the optimal pharmacokinetic/pharmacodynamic parameters associated with vancomycin efficacy.
Describe the relationship between initial vancomycin dose, trough concentration (<15 vs. ≥15 mcg/mL), MIC and patient outcomes.

Self Assessment Questions:
Which of the following is the optimal AUC/MIC ratio for vancomycin that correlates with clinical success?
A 100
B 200
C 300
D 400

Which of the following vancomycin MIC values are most associated with treatment failure?
A 0.12
B 0.25
C 0.5
D 2

Q1 Answer: D Q2 Answer: D

ACPE Universal Activity Number 121-999-11-280 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
IMPACT OF CLINICAL PHARMACY INTERVENTIONS ON QUALITY OF LIFE IN PATIENTS WITH PARKINSON'S DISEASE

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PURPOSE
Parkinson's disease is a neurodegenerative disease that results from the loss of dopaminergic neurons in the substantia nigra pars compacta. The chronic and progressive nature of Parkinson's disease can have a profound impact on a patient's quality of life. The purpose of this study is to evaluate the impact of clinical pharmacy interventions on the quality of life (QOL) in patients with Parkinson's disease.

METHODS
A prospective, cohort study was designed to evaluate the impact of clinical pharmacy interventions on QOL in patients with Parkinson's disease. The study was conducted at the St. Rita's Medical Center (SRMC) Parkinson's Disease clinic and was approved by SRMC's Institutional Review Board. In the SRMC Parkinson's clinic, the clinical pharmacist sees patients concurrently with the physician so interventions can be made during the appointment. The interventions made were quantified and placed into the following categories: discontinue medication, initiate medication, dose adjustment and medication reconciliation. At the initial visit, demographics, Parkinson's disease stage and a baseline QOL questionnaire was obtained. Staging of Parkinson's disease was determined utilizing the Hoehn and Yahr scale, and performed by the physician. The Parkinson's Disease Questionnaire-39 (PDQ-39) was used to assess QOL. Permission was granted by Isis Innovation Limited for copyright privileges to the PDQ-39. The questionnaire was completed by patients, or verbally administered by a clinical pharmacist, upon the patients request. After each visit, the patients PDQ-39 score was stored for future use. Also, the type and number of interventions made by a clinical pharmacist was tracked and analyzed upon completion of the study. Data was analyzed to compare QOL at baseline to QOL at three months and to determine any correlation between clinical pharmacy interventions and QOL.

RESULTS/CONCLUSIONS: To be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Discuss the ways that Parkinson's Disease impacts a patient's quality of life.  
Identify the opportunities for clinical pharmacy interventions in Parkinson's Disease.

Self Assessment Questions:
Of the ways that Parkinson's Disease impacts a patient's quality of life, which is the most troubling to the patient?  
A: Emotional well being  
B: Mobility  
C: Bodily discomfort  
D: Cognitive impairment  
Which of the following is an opportunity for clinical pharmacy intervention in Parkinson's Disease?  
A: Medication reconciliation  
B: Dose adjustment  
C: Initiate medications  
D: All of the above  
Q1 Answer: B  Q2 Answer: D

Acute Universal Activity Number  121-999-11-065 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
THE USE OF SUPPLEMENTED DEXTROSE INFUSION IN MEDICALLY CRITICALLY ILL ADULT PATIENTS
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Purpose: Early nutritional support is imperative to fulfill the increased metabolic needs associated with acute illness, with enteral nutrition as the recommended route. Enteral nutrition (EN) is preferred over parenteral nutrition (PN) based on data suggesting decreased morbidity and mortality. At our institution one option for patients unable to receive EN acutely is to administer a daily supplemented dextrose infusion composed of 10% dextrose, multivitamins and trace elements. The primary outcome of this study is to evaluate time to initiation of EN in patients that received the supplemented dextrose infusion compared to those who did not. Several secondary objectives will be evaluated to aid in characterizing the use of the supplemented dextrose infusion at our institution.

Methods: This was a retrospective, cohort chart review conducted at a tertiary teaching institution. Medically critically ill patients requiring mechanical ventilation were included if predefined inclusion and exclusion criteria were met. Patients receiving the supplemented dextrose infusion were matched in a 1:1 fashion, via propensity score, with patients who did not. Baseline characteristics were compared using Student unpaired t test or Wilcoxon Rank Sum Test in the case of continuous variables and chi-square test in the case of dichotomous variables. Cox proportional hazard regression was performed to analyze the primary objective. Hazard ratios were computed from the coefficients in Cox Proportional model and 95% confidence intervals were calculated for all the variables.

Results: Data collection in progress, results to be presented.

Conclusions: It is anticipated that this project will demonstrate that use of supplemented dextrose infusion will not delay time to initiation of enteral nutrition.

Learning Objectives:
Review current guidelines and literature to aid in nutritional recommendations for adult medically critically ill patients. Discuss the theoretical data and rationale to support the use of a supplemented dextrose infusion utilized at our facility.

Self Assessment Questions:
If no relative contraindications exist, what type of nutrition is primarily recommended by the ASPEN guidelines?
A: Enteral nutrition (EN)
B: Peripheral parenteral nutrition (PPN)
C: Total parenteral nutrition (TPN)
D: None of the above

Nutrition in critically ill patients is imperative because of which of the following reasons?
A: Combat the enhanced catabolic stress associated with acute illness
B: Preventing oxidative cellular injury
C: Favorable modulation of the immune system
D: All of the above

Q1 Answer: A  Q2 Answer: D

ACPE Universal Activity Number 121-999-11-382 -LO4-P
Activity Type: Knowledge-based  Contact Hours: 0.5

PHARMACIST-LED MEDICATION RECONCILIATION FOR PATIENTS ADMITTED TO THE PEDIATRICS UNIT: A PATIENT SAFETY INITIATIVE
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Purpose: Inaccurate or incomplete medication reconciliation acquired at patients hospital admissions has the potential to cause inpatient medication errors. The pediatric population presents a unique challenge, as weight-based dosing, and specialized dosage forms and concentrations further increase the risk of errors. Pharmacist-led medication reconciliation could potentially improve the accuracy of medication histories obtained on admission. The primary objective is to evaluate the error rate before and after the pharmacist-led medication reconciliation pilot. The secondary objectives include classification of errors by type pre and post initiative, and analysis of pharmacy resources required to complete medication reconciliation.

Methods: The first phase involved a retrospective pediatric chart review evaluating admission medication history errors that occurred using the current practice of medication reconciliation. Reviewable charts included those of patients less than 19 years old admitted to general pediatrics between 03/01/10-03/31/10. Errors identified during this review were evaluated by type, and included inappropriate or incomplete dose, route, and frequency. During the second phase of the initiative, a clinical pharmacist will complete a one-on-one medication history with the patient and/or guardian within 24 hours of admission. These histories will be reviewed by a second pharmacist who will re-evaluate for inappropriate or incorrect dose, route, and frequency. The frequency and types of errors between phases one and two will be compared. Time spent by the initial pharmacist to complete the medication reconciliation process will be documented for the purpose of determining resource requirements.

Results:
Of the 92 charts reviewed, an error rate (defined as total number of errors divided by the total number of home medications) was 37.2%. Fifty percent of the errors were associated with incomplete or inappropriate dose.

Phase two of the research is in the data collection phase. Final results and conclusion will be presented at the Great Lakes Pharmacy Conference.

Learning Objectives:
Describe the types and rates of medication errors identified pre and post pharmacist-led medication reconciliation. Explain how pharmacist-led medication reconciliation improves the accuracy of medication histories obtained upon pediatric inpatient admissions.

Self Assessment Questions:
Which of the following pieces of information is necessary to obtain a complete patient medication history?
A: Dose
B: Route
C: Frequency
D: All of the Above

Which of the following is a reason that medication reconciliation in the pediatric population may be complicated and have the potential for an increased risk of a medication error?
A: The patients do not receive as much attention as adults
B: Patients often require specialized dosage forms and concentration
C: There is no way to retrieve medication histories for some pediatric
D: They are not at a higher risk because they do not have home med

Q1 Answer: D  Q2 Answer: B

ACPE Universal Activity Number 121-999-11-481 -LO5-P
Activity Type: Knowledge-based  Contact Hours: 0.5
STABILITY OF AN EXTEMPORANEOUSLY PREPARED TADALAFIL SUSPENSION

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Purpose
The stability of an extemporaneously prepared tadalafil oral suspension was studied.

Methods
An oral suspension of tadalafil 5 mg/mL was prepared by thoroughly grinding fifteen 20-mg tablets of tadalafil in a glass mortar. Thirty milliliters of Ora-Plus and 30 mL of Ora-Sweet were mixed and added to the powder to make a final volume of 60 mL. Three identical samples of the formulation were prepared and placed in 2-oz amber plastic bottles with child-resistant caps and were stored at room temperature (23-25°C). A 1-ml sample was withdrawn from each of the three bottles with a micropipette immediately after preparation and at 7, 14, 28, 57, and 91 days. Following double dilution (1:10, 0.1:5 v/v) to an expected concentration of 10 g/mL with methanol and mobile phase respectively, the samples were assayed in duplicate using stability-indicating high-performance liquid chromatography. The samples were visually examined for any color change and evaluated for pH on each day of analysis. Taste evaluation was performed at the beginning and end of the study. Stability was determined as the retention of at least 90% of the initial concentration.

Results
At least 99% of the initial concentration of the tadalafil remained throughout the 91-day study period in the preparation. There were no detectable changes in color, odor, taste, and pH and no visible microbial growth was observed in any sample.

Conclusion
An extemporaneously prepared suspension of tadalafil 5 mg/mL in a 1:1 mixture of Ora-Plus and Ora-Sweet was stable for at least 91 days when stored in amber plastic bottles at room temperature.

Learning Objectives:
Describe the preparation of a 5 mg/mL tadalafil suspension.
Define the stability of a 5 mg/mL extemporaneously prepared tadalafil suspension.

Self Assessment Questions:
A tadalafil suspension was made with which of the following ingredients?
- A Ora-Plus
- B Starch
- C Glycerin
- D Castor oil

Tadalafil 5 mg/mL suspension is stable for _______ days at room temperature.
- A 31 days
- B 57 days
- C 91 days
- D 120 days

Q1 Answer: A Q2 Answer: C

IMPACT OF PHARMACIST INTERVENTION ON INTRAVENOUS PATIENT CONTROLLED ANALGESIA IN OPIOID-NAVE PATIENTS

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BACKGROUND INFORMATION: Intraoperative patient controlled analgesia (IV-PCA) is a widely accepted means for managing pain, but serious risks, including respiratory depression, exist. The occurrence of respiratory depression may lead to increased morbidity, increased mortality, increased hospital length-of-stay, increased overall care costs, and decreased patient satisfaction. One of the major risk factors for developing respiratory depression is the use of an IV-PCA basal infusion in an opioid-naive patient. Pharmacists may serve a role in eliminating IV-PCA basal infusions in opioid-naive patients, which could decrease the incidence of respiratory depression.

OBJECTIVE: Does a pharmacist-led intervention on IV-PCA use in patients who have undergone total knee or hip replacement surgery decrease the occurrence of respiratory depression while still adequately managing pain?

METHODS: The FDA guidelines and clinical judgment were used to establish the definition of the opioid-naive patient, which was approved by the local Pharmacy and Therapeutics (P&T) Committee. Patients were asked to complete a questionnaire regarding current opioid use prior to surgery. When a basal infusion was ordered, the pharmacist assessed the patients reported daily opioid intake to determine if the patient was opioid-naive or opioid-tolerant. If the patient was determined as opioid-naive, the pharmacist eliminated the basal infusion, per surgeon- and P&T-approved protocol. Data collected included number of basal infusion interventions made by pharmacists, doses of naloxone used, patient pain scores, and number of pain assessments per patient. The study will focus on the use of naloxone and reported patient pain scores compared to historical controls. Secondary outcomes will include number of interventions, number of reported pain assessments, and physician/nurse satisfaction.

RESULTS: Data collection is in progress. Final results will be presented at the Great Lakes Pharmacy Resident Conference in April 2011.

Learning Objectives:
List risk factors for developing respiratory depression.
Recognize patients for whom an IV-PCA basal infusion is appropriate.

Self Assessment Questions:
Which of the following is a risk for developing respiratory depression when an IV-PCA is used?
- A Use of a basal infusion in a patient who is opioid naïve
- B Use of a basal infusion in a patient who is opioid tolerant
- C Use of bolus doses only in a patient who is opioid naïve
- D Use of bolus doses only in a patient who is opioid tolerant

Which patient should IV-PCA basal infusions be reserved for?
- A A patient who is 80 years old
- B A patient with sleep apnea
- C A patient who is opioid tolerant
- D A patient who is opioid naïve

Q1 Answer: A Q2 Answer: C

ACPE Universal Activity Number 121-999-11-360-L04-P
Activity Type: Knowledge-based Contact Hours: 0.5

ACPE Universal Activity Number 121-999-11-484-L05-P
Activity Type: Knowledge-based Contact Hours: 0.5
EFFECT OF LIQUID ITRACONAZOLE FOR ANTIFUNGAL PROPHYLAXIS IN PATIENTS WITH ACUTE MYELOID LEUKEMIA UNDERGOING INDUCTION THERAPY

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PURPOSE: Invasive fungal infections (IFI) cause significant morbidity and mortality in acute myeloid leukemia (AML) patients undergoing induction or re-induction therapy. Because of the difficulty in diagnosing IFI in this patient population, various antifungals are recommended for antifungal prophylaxis. Although not entirely conclusive, current data suggest that the liquid formulation of itraconazole but not capsules may reduce the fungal-related mortality and fungal infections in patients with hematologic malignancies. However, the efficacy of the liquid formulation in AML patients at Cleveland Clinic is not known. This study aims to evaluate the clinical efficacy of liquid itraconazole used for antifungal prophylaxis in patients with AML undergoing induction therapy. The primary objective consists of comparing the incidence of IFI in the presence or absence of liquid itraconazole. Secondary objectives include assessing the number of patients initiated on a broader spectrum antifungals (voriconazole, posaconazole, or amphoterin B products), their duration of therapy, and the time to development of an IFI from onset of neutropenia.

METHODS: This is a retrospective chart review of AML patients treated at the Cleveland Clinic. Data to be collected include age, gender, past medical history, induction therapy regimen, drug doses, duration of neutropenia, and whether the patient underwent re-induction therapy due to persistent disease. If itraconazole was replaced with a broader spectrum antifungal drug and duration of treatment will be recorded. Time to development of an IFI from onset of neutropenia, type of fungal infection (proven, probable, possible), site of infection, and type of fungus (if any identified) will be collected. The primary endpoint will be evaluated using Fisher’s exact or chi-squared test. Secondary endpoints will be analyzed using Kaplan-Meyer with log-rank test. Cox multivariate regression analysis will be utilized to determine hazard ratios and to account for potential confounders.

RESULTS: To be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Recognize the infection risk that Acute Myeloid Leukemia (AML) patients are exposed to while undergoing induction therapy.

Discuss the recommended guidelines for antifungal prophylaxis in AML patients undergoing induction therapy.

Self Assessment Questions:

What level of risk for fungal infections do patients with AML undergoing induction therapy have?

A: None
B: Low
C: Intermediate
D: High

Which of the following antifungal drugs is recommended for antifungal prophylaxis in AML patients undergoing induction therapy?

A: Clotrimazole
B: Nystatin
C: Itraconazole
D: Posaconazole

Q1 Answer: D Q2 Answer: D

ACPE Universal Activity Number 121-999-11-277 -L01-P

Activity Type: Knowledge-based Contact Hours: 0.5

IMPACT OF PHARMACIST EDUCATION ON MEDICATION RECONCILIATION IN A COMMUNITY HOSPITAL

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Background: Studies have shown that certain medication classes are more likely to cause medication errors than others, and a pharmacist's input has been shown to be beneficial. The Joint Commission has assessed the issue of medication reconciliation, and as of December 2010, National Patient Safety Goal 03.06.01, effective July 1, 2011 targets medication reconciliation. Currently at Vista, medication histories do not include pharmacy involvement and sometimes require clarification.

Purpose: The objective of this project is to determine the four classes of medications that require the most clarifications by a pharmacist from the home medication reconciliation orders at admission. Pharmacist led education will be provided on these classes, and after education takes place the number of clarifications will be assessed to determine if a pharmacist's education improves medication reconciliation.

Methods: A chart review of 267 patients admitted during the month of October was conducted to determine the medication classes on the home medication reconciliation orders that require the most number of clarifications. Inclusion criteria: admitted patients at least eighteen years of age, Exclusion criteria: patients admitted to labor and delivery or post partum units. The following information was collected: date, day of the week, floor, number of new admissions on that floor that particular day, patient age, medication name, disease state classification, directions for use, clarification needed, and the total number of medications on the home medication reconciliation. McKesson Horizon MedComm will be used to access an electronic copy of the medication reconciliation orders. After the top four medication classes were determined, various forms of education will be provided to the nursing staff about the medications in that class. An ongoing record will be kept to assess the number of clarifications still needed on medication classes previously educated on.

Results/Conclusions: Will be presented at the Great Lakes Residency Conference

Learning Objectives:

Identify the medication classes that have been shown to cause the most medication errors.

Recognize barriers to obtaining a complete medication history from a patient.

Self Assessment Questions:

Previous studies have shown that the following classes have shown to cause the most medication errors:

A: Cardiovascular agents, antidepressants, gastrointestinal agents, a
B: Analgesics, anti-asthmatics, cardiovascular agents, and anti-diab
C: Cardiovascular agents, antidepressants, analgesics, and anti-asth
D: Antidepressants, analgesics, anti-asthmatics, and neurologic ager

Barriers to obtaining a complete medication history include:

A: Language
B: Multiple prescribing physicians
C: Multiple pharmacies used
D: All of the above

Q1 Answer: A Q2 Answer: D

ACPE Universal Activity Number 121-999-11-371 -L04-P

Activity Type: Knowledge-based Contact Hours: 0.5
HEART FAILURE MEDICATION DISCHARGE COUNSELING PILOT PROGRAM
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PURPOSE: The purpose of the pilot program is to develop the process by which the Cleveland Clinic Department of Pharmacy will implement a Heart Failure Medication Discharge Counseling Program. The objectives of this program are to implement a pharmacy driven discharge process to improve transition of patient care and strengthen patients knowledge of heart failure medications through concentrated discharge education.

METHODS: Adult patients discharged to home from the heart failure service at the Cleveland Clinic between November 1-December 30, 2011 were included in the program. The clinical pharmacist and pharmacotherapy resident communicate with the primary team to identify patients to be discharged within 24-48 hours. The resident reviews discharge medications, resolves discrepancies between the previous and discharge medication lists with the treating physician, and creates a MedActionPlan for Heart Failure (v5.0). The resident meets with the patient to counsel them using the Teach Back method and tools to enhance patient understanding including the MedActionPlan and the Cleveland Clinic heart failure education booklet. This individual pharmacist-patient interaction provides an opportunity for any questions to be answered. The education session is documented in the patients electronic medical record. Upon completion of the counseling session, patients are asked to voluntarily complete a satisfaction survey and if they would be willing to be contacted by phone in 30 days. During the follow-up phone call, the pharmacist will inquire about any medication changes, side effects, clinic visits, and hospital re-admissions or emergency department visits. Two months after the beginning of the pilot program data will be analyzed to determine 30-day readmission rates.

RESULTS: Data collection for this project is currently ongoing. Results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Review the rationale of implementing a heart failure medication discharge counseling pilot program.
Describe the methods of implementing a heart failure medication discharge counseling pilot program.

Self Assessment Questions:
What are some potential implications of pharmacist involvement in the patient discharge process?
A. Reduce adverse outcomes by reconciling medication discrepancies
B. Improve patient knowledge by providing medication education
C. Reduce hospital readmissions and emergency department visits
D. All of the above

What are some expected benefits of implementing a heart failure medication discharge counseling pilot program?
A. Improve transitions of care
B. Strengthen patient heart failure medication education
C. Improve patient satisfaction scores
D. All of the above

Q1 Answer:  D  Q2 Answer:  D  
ACPE Universal Activity Number 121-999-11-050 -L01-P  
Activity Type: Knowledge-based  Contact Hours: 0.5

EVALUATION OF MEDICATION DISPENSING ERROR RATES AND CENTRAL PHARMACY STAFFING AFTER THE IMPLEMENTATION OF AN AUTOMATED MEDICATION STORAGE AND RETRIEVAL SYSTEM
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Purpose:
Pharmacy automation has the potential to increase medication dispensing accuracy as well as reduce staffing resources necessary to complete daily medication distribution functions. To justify the substantial investment necessary to procure new pharmacy automation, it is imperative to determine if the acquired devices achieve their expected results. MedCarousel technology automates hospital central pharmacy medication storage and retrieval. The purpose of this study is to analyze the accuracy of medications dispensed and the staffing resources required to perform the medication distributive functions of first dose dispensing, medication cart-fill and Pyxis medication cabinet replenishment pre and post-implementation of MedCarousel within a community hospital.

Methods:
This prospective study will take place between March 2011 and May 2011 and has been approved by the institutional review board of the participating community hospital. Pre-implementation, medication dispensing error rates will be determined within three medication dispensing processes: (1) medication cart-fill, (2) first-dose medication dispensing via pharmacist reporting of all errors detected and (3) the Pyxis medication cabinet replenishment process via random medication sampling. The observation period will last for two weeks, ending one week prior to the implementation of MedCarousel. One week post-implementation of MedCarousel, the medication error rates of the three dispensing processes will be reported for two weeks in the exact manner utilized during the pre-implementation phase. The primary outcome of measure is the comparison of pre and post MedCarousel implementation dispensing error rates detected within the daily medication distribution processes of medication cart fill, first-dose medication dispensing and Pyxis medication cabinet replenishment.

Summary of Results:
Results and preliminary conclusions to be presented at the 2011 Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Describe how automated pharmacy storage and retrieval systems can improve the accuracy of medications dispensed within a community hospital.
Explain how automated medication storage and retrieval systems can be utilized to free pharmacy technician staff to participate in other pharmacy related functions.

Self Assessment Questions:
MedCarousel technology incorporates what safety feature designed to improve the accuracy of medication dispensing?
A. Robotic medication repackaging
B. Bio-identification of user
C. Medication barcode scanning
D. Automated medication profile review

What is the minimum number of pharmacy personnel needed to operate one MedCarousel device?
A. 1
B. 2
C. 3
D. 4

Q1 Answer:  C  Q2 Answer:  A  
ACPE Universal Activity Number 121-999-11-486 -L05-P  
Activity Type: Knowledge-based  Contact Hours: 0.5
THE ROLE OF AN ELECTRONIC ALERT IN ACTIVATING PHARMACIST-LED SEPSIS EVALUATION AND THE IMPACT ON ADHERENCE TO GUIDELINES

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Purpose:
The Surviving Sepsis Campaign is a multiphase program that aimed to reduce the mortality associated with sepsis. We sought to evaluate adherence to Surviving Sepsis guidelines before and after implementation of an electronic alert that notifies emergency department pharmacists of possible septic patients.

Methods:
Consecutive patients admitted to the hospital from the ED with ICD-9 codes indicating severe sepsis and septic shock were retrospectively identified. Patients were excluded if they were less than 18 years old, pregnant, received treatment at another institution prior to admission, or had advance directives restricting the implementation of the Surviving Sepsis Guidelines. All objectives compare patients in two groups presenting before and after the implementation of an electronic alert to ED pharmacists. The primary objective of this study was the percent of patients where the Surviving Sepsis Campaign Resuscitation Bundle was completed in its entirety. Secondary objectives included in-hospital mortality, appropriate antibiotic selection and compliance with individual components of the resuscitation bundle.

Preliminary Results:
In the phase before the implementation of the electronic alert, 21 patients were included in the analysis. Of the included patients, 66.7% received a fluid bolus greater than or equal to 20ml/kg. Within 6 hours of presentation, 42.9% had a recorded serum lactate level greater than 4mmol/L. Six patients (28.6%) did not survive to hospital discharge. Final results will be presented at the Great Lakes Pharmacy Resident Conference.

Conclusions:
Data collection and analysis is ongoing. Conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
List the components of the Surviving Sepsis Resuscitation Bundle.
Explain the benefits of implementing the Surviving Sepsis Guidelines.

Self Assessment Questions:
According to the Surviving Sepsis Resuscitation Bundle, antibiotics must be administered within:

A: 6 hours of ED presentation
B: 8 hours of EMS contact
C: 3 hours of ED presentation
D: 2 hours of ICU admission

Surviving Sepsis Campaign Resuscitation and Management Bundles have been shown to improve patient outcomes when:

A: more than 80% of the elements are completed within specified time frames
B: all elements are completed within 6 hours of ICU admission
C: more than 50% of the elements are completed within the first 3 hours
D: all elements are completed within specified time frames

Q1 Answer: C   Q2 Answer: D

ACPE Universal Activity Number 121-999-11-350-L01-P
Activity Type: Knowledge-based   Contact Hours: 0.5

OPTIMAL DOSING OF DALTEPARIN IN OBESITY: A PHARMACOKINETIC STUDY

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Purpose:
VTE is a common complication in hospitalized patients as well as otherwise healthy adults, resulting in significant morbidity, mortality, prolonged hospital stays, and increase hospital costs. Treatment of VTE is recommended in order to prevent further extension and potential embolization of the thrombus as well as complications such as recurrent VTE, postthrombotic syndrome, and pulmonary sequelae. The American College of Chest Physicians recommend patients be treated with pharmacological therapy with either unfractionated heparin (UFH), low-molecular-weight-heparin (LMWH) or fondaparinux. Dalteparin (Fragmin) is one of the three commercially available LMWHs in the United States. Dosing is weight based and, due to prolonged duration of action, dosed once or twice daily. With weight based dosing, there is some uncertainty with the efficacy and safety of dosing above suggested dosing maximums as stated in the package insert. The primary objective of this study is to determine if standardized dosing of dalteparin in obese patients results in therapeutic anti-Xa levels. The secondary objective of this study is to look at the rate of complications, such as bleeding and recurrent VTE.

Methods:
This study is a prospective, observational, pharmacokinetic study looking anti-Xa levels in obese patients therapeutically anticoagulated with dalteparin for venous thromboembolism at Rush University Medical Center from November 1, 2010 to April 1, 2011. The following data will be collected: patient demographics, details of the dalteparin regimen, anti-Xa level results, and other secondary endpoint results. Baseline characteristics and primary and secondary endpoints will be assessed statistically to validate results.

Results/Conclusions:
Final results and conclusions will be presented at the Great Lakes Pharmacy Conference.

Learning Objectives:
Describe pharmacokinetic parameters of low molecular weight heparin (LMWH), specifically dalteparin.
Review current literature of LMWH dosing for VTE treatment in obesity.

Self Assessment Questions:
Which statement is correct regarding the pharmacokinetics of LMWH?

A: Volume of distribution is decreased; clearance is decreased
B: Volume of distribution is increased; clearance is decreased
C: Volume of distribution is decreased; clearance in increased
D: Volume of distribution is increased; clearance is increased

Which statement best reflects the evidence regarding for dosing of LMWH for VTE treatment in obesity?

A: Patients should be dosed based on ideal body weight (IBW)
B: Patients should be dosed based on actual body weight (ABW)
C: Patients should be dosed based on adjusted body weight (AdjBW)
D: Patients should be placed on fixed doses, not weight-based doses

Q1 Answer: D   Q2 Answer: B

ACPE Universal Activity Number 121-999-11-344-L01-P
Activity Type: Knowledge-based   Contact Hours: 0.5
EVALUATION OF NEW-ONSET ATRIAL FIBRILLATION AS AN INDEPENDENT RISK FACTOR FOR IN-HOSPITAL MORTALITY IN THE MEDICAL INTENSIVE CARE UNIT

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Purpose: New-onset atrial fibrillation (AF) affects 6 to 31 percent of all critically ill patients. While new-onset AF during the post-operative period of cardiac or thoracic surgery has been shown to be associated with increases in morbidity and mortality, there is less literature regarding outcomes in non-cardiothoracic critically ill patients who develop new-onset AF. The purpose of this study was to determine if new-onset AF is an independent risk factor for in-hospital mortality. Secondary objectives included: 60-day mortality, intensive care unit (ICU) length of stay, hospital length of stay, risk factors for the development of new-onset AF and outcomes by electrical cardioversion compared to pharmacologic therapy.

Methods: A retrospective cohort analysis was conducted. Patients admitted to the medical ICU at University of Chicago Medical Center between June 2008 and June 2010 without a history of AF or recent cardiothoracic surgery were included in the analysis. Patients were identified using ICD-9 codes and the electronic medical record. Demographic data was collected, in addition to: in-hospital mortality, 60-day mortality, ICU length of stay, hospital length of stay, risk factors for development of new-onset AF and therapeutic modalities used to treat AF. Baseline characteristics were evaluated using chi-square or Fischers exact test for nominal data and Students t-test for continuous data. Multivariate, stepwise logistic regression and Cox regression models were performed to determine if new-onset AF was an independent risk factor for in-hospital mortality. Linear regression was performed for continuous outcomes data.

Results/Conclusion: Results are forthcoming.

Self Assessment Questions:

Paroxysmal atrial fibrillation in patients with septic shock has been associated with:

A: Decreased 28-day mortality
B: Increased 28-day mortality
C: Increased need for mechanical ventilation
D: Higher likelihood of discharge to home

Critically ill patients in the intensive care unit are at increased risk of development of atrial fibrillation secondary to:

A: Severity of illness (APACHE II > 20)
B: Use of sedative agents
C: Use of vasoactive agents
D: A and C

Q1 Answer: B Q2 Answer: D

ACPE Universal Activity Number 121-999-11-316 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

ASSESSMENT OF NEED AND DEMAND FOR MEDICATION MANAGEMENT SERVICES IN AN INDEPENDENT COMMUNITY PHARMACY

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Purpose: This study will assess the need and demand for a medication therapy management service at Wellspring Pharmacy, an independent community pharmacy chain. The three pharmacy locations are located within three of the Community Health Network (CHN) hospitals and primarily fill prescriptions for employees of the network. Community Health Network is a self-insured employer and the majority of Wellspring patients carry the networks prescription insurance plan. This prescription plan does not currently offer medication therapy management (MTM) as a prescription insurance benefit. However, medication therapy management services are reimbursed by all Medicare Part D plans for individuals who meet Medicare eligibility criteria. This study will identify the population of Wellspring patients with Medicare Part D who are potentially eligible to receive services. This study will also analyze the population covered by CHN prescription insurance to identify patients who are most likely to benefit from medication therapy management services, as defined by Medicare eligibility criteria. Because it is not currently an offered service, this study will also address patient demand for the service to be offered in the future.

Methods used: A retrospective analysis of claims data from Wellspring pharmacy will be performed from January 1, 2010 through December 31 2010 to identify patients who have filled prescriptions through Medicare Part D plans. Plans of potentially eligible patients will then be researched to determine specific eligibility criteria. A retrospective analysis of claims data from the networks prescription drug plan database during the same time frame will also be performed. A retrospective chart review of potentially eligible patients will then be performed. A retrospective chart review of potentially eligible patients will then be performed. A retrospective chart review of potentially eligible patients will then be performed. A retrospective chart review of potentially eligible patients will then be performed. A retrospective chart review of potentially eligible patients will then be performed. A retrospective chart review of potentially eligible patients will then be performed.

Results and conclusion: In progress. To be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

List general eligibility criteria for medication therapy management services through Medicare Part D.

Identities effects of MTM services on health care utilization.

Self Assessment Questions:

MTM services have been shown to

A: Increase prescription drug costs
B: Decrease physician office visits
C: Increase emergency department visits
D: All of the above

Q1 Answer: B Q2 Answer: A

ACPE Universal Activity Number 121-999-11-138 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
PHARMACISTS ROLE IN REDUCING HEART FAILURE READMISSION RATES IN THE VETERANS AFFAIRS SYSTEM
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Purpose: Effective communication between inpatient and outpatient providers as well as appropriate patient education on dietary and medication compliance is critical for patients with heart failure to reduce morbidity. The purpose of this study was to evaluate the causes of rehospitalization due to heart failure at the Richard L. Roudebush Veterans Affairs Medical Center in order to establish procedures to decrease the rate of readmissions.

Methods: A retrospective chart review was conducted on patients who had been discharged with a primary diagnosis of heart failure and were readmitted within a 90-day period between September 1, 2008 and November 30, 2009. Patient charts were evaluated and reviewed for demographics and to determine if the cause of readmission was attributed to medication non-compliance, dietary non-compliance, and/or an underlying chronic condition. Descriptive statistics were performed on the data to monitor trends. Opportunities for pharmacist intervention were identified to help decrease the rate of hospital readmissions in heart failure patients.

Results: Sixty-nine patients with a primary diagnosis of heart failure who were readmitted within 90 days after an initial hospitalization for heart failure were evaluated. Baseline characteristics included an average age of 69.52 years, average weight of 97.73 kg with an average body mass index of 31.89 kg/m². After reviewing the data, it was found that 27.54% and 21.74% of patient readmissions were attributed to medication and dietary non-compliance, respectively.

Conclusions: Medication and dietary non-compliance are known factors that contribute to heart failure readmission rates. The results of our review are similar to previous finding which support close monitoring of patients after discharge. It demonstrates that patient education is essential in successful heart failure management. By reducing dietary and medication non-compliance through education measures and close follow-up, heart failure readmissions should also be reduced.

Learning Objectives:
Indicate patients at risk for developing heart failure.
Discuss the role of pharmacists and other healthcare professionals in managing patients with heart failure.

Self Assessment Questions:
Risk factors for developing heart failure include:
A: Coronary artery disease
B: Diabetes mellitus
C: End-stage renal disease
D: A and B

The role of pharmacists and other healthcare professionals in managing patients with heart failure includes which of the following:
A: Decreasing rates of admissions
B: Decreasing compliance
C: Decreasing costs associated with heart failure admissions
D: A and C

EVALUATION OF BLEEDING EVENTS AND OUTCOMES IN PATIENTS RECEIVING FONDAPARINUX VERSUS ENOXAPARIN FOR PROPHYLAXIS OF VENOUS THROMBOEMBOLISM
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Purpose: Anticoagulant therapy is a key component of preventing venous thromboembolism (VTE), including deep vein thrombosis (DVT) and pulmonary embolism (PE). Both fondaparinux and enoxaparin have been approved for the prevention of VTE. The objective of this study is to assess the efficacy and safety of fondaparinux versus enoxaparin for prophylaxis of VTE.

Methods: This is a retrospective, single center, cohort study that has been approved by the institutional review board and scientific review committee of Saint Joseph Hospital. Patients will be identified using the hospital's electronic medical database and through electronic chart review. Data will be collected for patients receiving VTE prophylaxis doses of enoxaparin or fondaparinux between July 2008 and July 2010. Patients will be excluded if they have contraindications to either medication, creatinine clearance less than 30ml/min, less than 18 years of age, patients undergoing percutaneous intervention for acute coronary syndrome. Data collected will include demographic information, history of DVT or PE, use of aspirin, clopidogrel, warfarin, or prasugrel concomitantly, hemoglobin, hematocrit, INR, platelets, serum creatinine, length of stay, total cost of stay, cost of study medication, major and minor bleeding events using Thrombolysis in Myocardial Infarction (TIMI) criteria, thrombus formation, indication for therapy. A t test will be used to evaluate and compare parametric data. Chi square and Fisher's exact test will be used to evaluate and compare categorical data where appropriate. Descriptive statistics will be used to evaluate other data where appropriate. All tests will show statistical significance at a p value less than or equal to 0.05.

Results and Conclusions: Data collection currently in progress. Results and conclusions to be presented.

Learning Objectives:
Recall the dosing regimens of enoxaparin and fondaparinux used for the prevention of venous thromboembolism.
Describe the mechanisms of action for enoxaparin and fondaparinux.

Self Assessment Questions:
Which of the following statements is correct?
A: Fondaparinux is approved for prophylaxis of VTE in patients weighing
B: Enoxaparin requires dose adjustment for patients with renal dysfunction
C: Fondaparinux does not require dose adjustment for patients weighing
D: Enoxaparin is not approved for prophylaxis of VTE in patients weighing

Which of the following is the mechanism of action of fondaparinux?
A: Selective binding to antithrombin III which potentiates inhibition of thrombin
B: Inhibition of vitamin K epoxide reductase, depleting functional vitamin K
C: Inhibition of glycoprotein IIb/IIIa, reducing platelet aggregation
D: Irreversible inhibition of Cyclooxygenase, decreasing platelet aggregation

Q1 Answer: B   Q2 Answer: A

ACPE Universal Activity Number 121-999-11-300 -L01-P
Activity Type: Knowledge-based   Contact Hours: 0.5
**RELATIONSHIPS OF PHENOTYPIC RESISTANCE EXPRESSION IN PSEUDOMONAS AERUGINOSA AND ESCHERICHIA COLI**

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**Purpose:**
The ability of bacterial pathogens to adapt and overcome the challenges of antibiotics in their environment has been quite impressive. In recent years we have been met by a growing population of multi-drug resistant bacteria that often render currently marketed antibiotics ineffective. In an attempt to overcome multiglass resistance, clinicians often prescribe two antibiotics with different mechanisms of action in hopes that one is inactive, the other will be active. Antibiograms are not designed to address cross-resistance between antibiotics. This study provides insight into individual antimicrobial susceptibility results and their relationship to resistance rates of other drug classes, thereby assisting in the selection of empiric antimicrobial therapy and/or optimal combination therapy. The primary objective is to study whether phenotypic resistance to a given drug class occurs independently of other drug classes, occurs sequentially, or are linked. The secondary objective is to quantify and characterize phenotypic resistance in Pseudomonas aeruginosa and Escherichia coli, including relationships between resistance expressions.

**Methods:**
Data collected retrospectively from cultures received and processed by the Meriter Health Services microbiology laboratory from December 2008 to October 2010 will be analyzed to assess resistance patterns in Pseudomonas aeruginosa and Escherichia coli isolates. This data will be analyzed by site of infection (i.e., sputum, wound, urine, etc.), collection site (i.e., hospital or clinic), and susceptibility (including interpretation and MIC) of each organism to selected antibiotics. Resistance to the antibiotics will be evaluated and patterns will be assessed. Where possible, sequential patterns of resistance will also be studied.

**Results/Conclusion:**
Data analysis is ongoing. Results will be presented at the Great Lakes Pharmacy Residency Conference.

**Learning Objectives:**
Discuss the role of antibiotic resistant Gram negative bacteria in nosocomial infections.
Identify factors contributing to the increase in antimicrobial resistance and how clinicians select empiric and/or optimal antimicrobial therapy.

**Self Assessment Questions:**
Data from the World Health Organization Report on Infectious Diseases suggest that as many as 70% of Pseudomonas initially isolated from lower respiratory sources are already resistant to:

A: All Beta Lactams
B: At least one of the first-line antimicrobial agents
C: Fluoroquinolones
D: Cephalosporins

According to several surveillance studies compiled by Lister and colleagues, Pseudomonas aeruginosa exhibits the highest rates of resistance to:

A: Aminoglycosides
B: Penicillins
C: Fluoroquinolones
D: Cephalosporins

Q1 Answer: B  Q2 Answer: C

**EVALUATION OF THE SAFETY AND EFFICACY OF ANTI-SHIVERING THERAPY IN PATIENTS ON A THERAPEUTIC NORMOTHERMIA PROTOCOL**

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**Purpose:** To compare buspirone plus dexmedetomidine to buspirone plus propofol for anti-shivering therapy in patients on the therapeutic normothermia protocol in the NICU.

**Methods:** This is a retrospective observational cohort of patients in the NICU on the TNP at Rush University Medical Center from January 1, 2008 - April 1, 2010. Patients must be ≥ 18 years of age on the protocol for at least 12 hours. Excluded patients are those in vasodilatory shock requiring more than one vasopressor, and those with broken, denuded, or inflamed skin. The primary endpoint of this study is to assess the efficacy of buspirone plus propofol versus buspirone plus dexmedetomidine, as defined by the percentage of patients in each group that have persistence of shivering requiring the addition of meperidine to each regimen. Secondary endpoints include the total cumulative doses of fentanyl, meperidine, magnesium and cisatracurium in each group, the percentage of time shivering in each group, sedation scores using the Richmond Agitation Sedation Scale (RASS), and adverse effects between the two groups.

Data will be analyzed using SPSS. Means, standard deviations and percentages will be calculated from baseline variables. Comparisons of continuous variables will be done using a t test. A Chi-square test or Fischer’s exact test will be used to compare categorical variables. A multivariate regression analysis will be performed to assess for confounders that may affect the primary endpoint.

**Results:** Results are pending.

**Learning Objectives:**
Describe the physiologic process leading to fevers in brain and spinal cord injury patients.
Explain the therapeutic normothermia protocol, including indications for initiation, discontinuation and adverse effects.

**Self Assessment Questions:**
Which of the following are consequences of fevers in brain and spinal cord injury patients?

A: increased metabolic demand, oxygen consumption and free radicals
B: decreased in intracranial pressure and blood pressure
C: increased hospital length of stay and mortality
D: A and C

Which of the following is an adverse effect associated therapeutic normothermia protocol?

A: hypertension
B: skin ischemia and necrosis
C: increased rate of infection
D: lowering seizure threshold

Q1 Answer: D  Q2 Answer: B

**ACPE Universal Activity Number** 121-999-11-157 -L01-P

**Activity Type:** Knowledge-based  **Contact Hours:** 0.5

**ACPE Universal Activity Number** 121-999-11-234 -L01-P

**Activity Type:** Knowledge-based  **Contact Hours:** 0.5
EVALUATING COMPLIANCE WITH BASELINE MONITORING PARAMETERS FOR DRUGS IN AN INPATIENT SETTING

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Purpose:
To determine our institutions compliance with recommendations for obtaining baseline laboratory data when drugs with such recommendations are used, and then to measure the effectiveness of a pharmacy-driven intervention to increase compliance with given baseline monitoring recommendations.

Methods:
Phase I consisted of a retrospective chart review of 1491 patients who received a drug with baseline monitoring recommendations from January 1, 2010 to December 13, 2010. Subjects were limited to our inpatient Behavioral Health Unit and were included if they were between 18 and 89 years old and received a monitorable drug sometime during the study period; patients were excluded if the drug was a home medication prior to admission, if the drug was ordered but never administered, or if the drug was ordered as a one-time dose only. No discrimination was made based on patient age, gender, ethnic background, or health status.

Phase II consisted of implementing pharmacist-driven interventions (a rule in our CPOE system as well as standing orders approved by our Medical Executive Committee) and then using the same data collection tool as in Phase I to determine the effectiveness of these interventions on our ability to comply with baseline laboratory recommendations for a condensed list of monitorable drugs.

Phase I Results:
Of the 1491 patient charts reviewed, 596 met inclusion criteria. All baseline monitoring recommendations were followed for 10% of those orders and no recommendations were followed for 3.0%; 86.9% of charts reviewed had data pertaining to some, but not all, recommended baseline information. The most common monitorable drugs initiated during the study period on the Behavioral Health Unit were quetiapine (28.7%), divalproex (18.6%), ziprasidone (14.6%), lithium (8.2%), and risperidone (8.1%).

Conclusions:
Phase II results will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Recognize the importance of obtaining baseline monitoring parameters for drugs with such recommendations.
Discuss approaches to increase compliance with obtaining baseline laboratory data.

Self Assessment Questions:
1. Which of the following adverse reactions have most commonly been associated with the use of atypical antipsychotic agents?
   A. Weight loss
   B. Dyslipidemia
   C. Thrombocytopenia
   D. Hepatotoxicity

2. Which of the following parameters should be routinely obtained at baseline prior to initiation of valproic acid or its derivatives?
   A. Lipid panel, fasting blood glucose, white blood cell count
   B. Lipid panel, liver function tests
   C. Liver function tests, fasting blood glucose, platelet count
   D. Liver function tests, platelet count

Q1 Answer: B    Q2 Answer: D

ACPE Universal Activity Number 121-999-11-304-L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5

RATE OF VENOUS THROMBOEMBOLISM IN A NEUROSCIENCES INTENSIVE CARE UNIT

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Purpose:
The incidence of venous thromboembolism (VTE), including asymptomatic deep vein thrombosis (DVT), occurs in up to 80% of neurocritical care patients. The 2008 Chest guidelines recommend initiating combination pharmacologic (either low dose unfractionated heparin or low-molecular weight heparin) and mechanical prophylaxis for VTE in patients with acute intracranial hemorrhage as soon as 2 days from onset. However, the concern for hemorrhagic complications is commonly encountered as a barrier for initiation of pharmacologic VTE prophylaxis. The primary objective of this study is to compare the incidence of new onset VTE between patients started on pharmacologic prophylaxis within 10 days of admission versus those initiated after day 10 of admission to the Neurosciences Intensive Care Unit (NSICU).

Secondary objectives include identification of risk factors associated with VTE, time to new onset DVT or pulmonary embolism (PE) as well as incidence and timing of major intracranial and extracranial hemorrhagic complications.

Methods:
A retrospective cohort study, approved by the Institutional Review Board will be conducted in adult patients, 18 to 89 years old, admitted to the NSICU between January 2008 and September 2010. Patients with a primary diagnosis of acute ischemic stroke or brain neoplasm will be excluded as well as those who are pregnant or breastfeeding or who lack an order for mechanical prophylaxis. Data will be collected on patient demographics, primary diagnosis, surgical procedure(s), risk factors for VTE, pharmacologic prophylaxis regimen, hemorrhagic complications, date of admission and discharge from the intensive care unit, and date of discharge from the hospital. International classification of disease (ICD-9) codes will be utilized to identify patients with new onset DVT or PE. Outcome data will include NSICU length of stay, hospital length of stay, and mortality at discharge and at 30 days.

Results:
In process

Learning Objectives:
Define the reported incidence of venous thromboembolism (VTE) in high-risk neurology and neurosurgery patient populations.
Describe the controversy between the guideline recommendations for initiation of pharmacologic prophylaxis in a high-risk neurology and neurosurgery patient population and clinical practice.

Self Assessment Questions:
What is the incidence of asymptomatic deep vein thrombosis in patients with traumatic brain injury?
   A. 5-80%
   B. 20-35%
   C. 0-3.9%
   D. 0-1.8%

When do the American Heart Association guidelines for management of spontaneous intracerebral hemorrhage recommend initiating pharmacologic prophylaxis against VTE after documentation of cessation of bleeding?
   A. After 1 to 4 days from onset [Class Iib]
   B. Within 24 hours of onset [Class Ib]
   C. As soon as 2 days after onset [Class Iic]
   D. After 4 days from onset [Class Ia]

Q1 Answer: B    Q2 Answer: A

ACPE Universal Activity Number 121-999-11-167-L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
ASSESSING ANTICHOLINERGIC BURDEN IN HOSPITALIZED ELDERLY PATIENTS DIAGNOSED WITH DELIRIUM: DEVELOPMENT OF A DELIRIUM RISK ASSESSMENT TOOL

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Background:
The emerging population of individuals over the age of 65 presents a number of issues involving medication use including drug efficacy, metabolism, excretion, increased drug permeability, and frailty of neurotransmitter balance, resulting in increased vulnerability to developing delirium. Delirium rates for older hospitalized and ICU patients range anywhere from 44% to 81%. Older adults experiencing delirium have longer hospital stays, increased risk of discharge to a nursing home, and increased 6 month mortality. Numerous trials have shown that increased anticholinergic burden has been linked to decreased cognition in older adults, as well as higher incidences of delirium. However, this burden is not brought on by medications alone, but can also be due to illness. There have been few attempts to quantify anticholinergic burden in older patients, however, these efforts have resulted in methods that are impractical in daily practice and difficult to interpret at the bedside. The purpose of the current study was to develop an anticholinergic risk assessment tool to quantify anticholinergic burden in the incidence of delirium diagnoses in elderly patients.

Methods:
This single center retrospective study used a computer generated list to identify patients given an ICD-9 code for delirium in the hospital. Data collection included: gender; age; reason for admit; where admitted from; past medical history; social history; diagnoses; medication history; type of delirium; surgery prior to delirium diagnosis; urinary catheter placement during hospital stay; length of stay; and discharge disposition. Utilizing the data collected, weighted scores were determined for medications and disease states that correlated with a delirium diagnosis. These weighted scores were then used in the development of an anticholinergic risk assessment tool to quantify anticholinergic burden in older adults.

Results:
To be presented at the Great Lakes Pharmacy Residency Conference (GLPRC).

Conclusions:
To be presented at GLPRC.

Learning Objectives:
Discuss the extent to which anticholinergic burden plays a role in delirium development.
Identify what patients are at the greatest risk for developing delirium at our institution.

Self Assessment Questions:
Delirium in older patients can result in the following:
A Increased length of stay
B Increased risk for discharge to nursing home
C Increased 6 month mortality
D All of the above

What are risk factors for the development of delirium in patients 65 years of age and older?
A Renal insufficiency
B Diphenhydramine use
C Hip fracture
D All of the above

Q1 Answer: D Q2 Answer: D

ACPE Universal Activity Number 121-999-11-471 -L05-P
Activity Type: Knowledge-based Contact Hours: 0.5

EXPANDING ONCOLOGY SERVICES TO PEDIATRICS IN AN OUTPATIENT HOSPITAL SETTING

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Purpose:
In the past 35 years, the diagnoses of childhood cancers nationally have increased from 11.5 cases per 100,000 children in 1975 to 14.8 cases per 100,000 children. Pediatric oncology services are often established at a primary pediatric care center on an outpatient basis. For patients who do not live near the primary center, receiving maintenance therapy at a local or regional setting could provide a more convenient location. The purpose of this project is to establish maintenance phase pediatric outpatient oncology pharmacy services at a regional hospital in collaboration with a primary pediatric care center.

Methods:
To establish services within a regional hospital outpatient setting, benchmarking with facilities where currently established pediatric oncology satellite pharmacy services should be performed. Benchmarking information includes equipment, facilities, policies and procedures, staff development, and pediatric chemotherapy references. A site-specific pediatric chemotherapy reference should be developed that lists the standard dilutions and compounding procedures. Policies for extravasation and anaphylaxis should also be developed specifically for pediatric patients, and a competency for staff to ensure the pediatric oncology team receives the education and information needed to successfully implement services. Workflow should be determined in conjunction with other oncology team members. In addition, the creator of a video for patient information describes services, presents patients and parents with staff credentials and the entire workflow process. Once the services are implemented, customer satisfaction data and total time of patient visit should be collected to identify opportunities for improvement. This project will serve as one portion of a multi-disciplinary team effort to develop and implement services.

Results:
These services are in the process of implementation.

Conclusions:
Parents may benefit due to lower travel expenses and the child may benefit due to remaining in familiar home environment.

Learning Objectives:
Explain the process of instituting outpatient pediatric chemotherapy services in conjunction with a facility with well established pediatric chemotherapy services.
List the benefits of establishing pediatric chemotherapy services in a local or regional setting.

Self Assessment Questions:
What policies and procedures should be established prior to implementing outpatient pediatric chemotherapy services?
A Anaphylaxis
B Extravasation
C Adult chemotherapy standard dilution
D A and B are correct

What is the importance of developing competencies for oncology clinic staff members?
A To ensure the pediatric oncology team receives the education and
B To ensure the pediatric oncology team receives the experience the
C To ensure the pediatric oncology team receives the proper information
D To ensure the pediatric oncology team receives the proper introduction

Q1 Answer: D Q2 Answer: A

ACPE Universal Activity Number 121-999-11-428 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5
EFFICACY OF AMPICILLIN AND AMOXICILLIN FOR AMPICILLIN RESISTANT ENTEROCOCCUS FAECIUM URINARY TRACT INFECTIONS

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Background: Urinary tract infections (UTIs) account for over 7 million visits to physicians’ offices and necessitate or complicate over 1 million hospital admissions in the United States annually. Enterococcus species account for approximately 110,000 UTIs annually in the United States. Multidrug resistant strains of E. faecium have emerged as major pathogens. Due to higher urinary concentrations, many clinicians view amoxicillin and amoxicillin as viable treatment options in patients with ampicillin resistant enterococci (ARE) UTIs. However, there are currently no FDA approved antibiotics for E. faecium UTIs.

Purpose: To determine the efficacy of ampicillin and amoxicillin for ARE UTIs defined by current breakpoints in comparison with other prescribed antibiotics.

Methods: This study will be a retrospective, electronic chart review of JBVAMC veteran patients at least 18 years old with a positive E. faecium culture isolated to the urinary tract with susceptibility testing showing resistance to ampicillin along with a prescription for any antibiotic to eradicate the bacteria between the dates of January 1, 2005 and June 22, 2010. Exclusion criteria are asymptomatic patients with no repeat UA or culture within 6 months after the original culture identifying E. faecium as the uropathogen, symptomatic patients with no repeat UA or culture within 6 months and no appropriate follow up to assess ongoing symptoms within 6 months, the presence of any other organisms in the initial urine culture, the presence of E. faecium in the blood, patients treated with multiple antibiotics concurrently, patients with sequential treatment with different antibiotics with no evaluation of efficacy between courses. All included patients will be evaluated for resolution of signs/symptoms, improved urine analysis from baseline, and eradication of E. faecium from urinary culture.

Results/Conclusions: Data collection and analysis are ongoing. Final results will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
- Identify the risk factors for ampicillin resistant E. faecium UTIs.
- Explain the rationale for the use of amoxicillin in the treatment of ampicillin resistant E. faecium UTIs.

Self Assessment Questions:
- Which of the following patients is at highest risk for an ampicillin resistant E. faecium UTI?
  A: A 69 year old male with a urethral stent
  B: A 23 year old female with no significant past medical history
  C: A 31 year old pregnant woman
  D: A 36 year old male with no significant past medical history

Which of the following makes amoxicillin a viable treatment option for ampicillin resistant E. faecium UTIs?
- It has a prolonged half-life
- It is hepatically eliminated
- It is renally eliminated therefore achieves higher urinary concentran
- It has good coverage against gram negative organisms

Q1 Answer: A  Q2 Answer: C

ACPE Universal Activity Number 121-999-11-117 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5

HEALTH LITERACY IN VA DIABETES POPULATION

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Purpose:
Health literacy is defined as the degree to which individuals are capable of attaining and processing basic health information, as well as the ability to make appropriate health decisions. Many studies have shown that low health literacy is associated with poorer health status, a higher frequency of severe hypoglycemia, increased hospitalizations and mortality, and higher health care costs. Diabetes is one of the most challenging chronic diseases to manage. The purpose of this study is to determine if retrospective diabetes endpoints, blood pressure, lipids, hospitalizations, severe hypoglycemic episodes, or Emergency Department visits in the past year relate to current level of health literacy in VA patients with diabetes.

Methods:
Patients will be pre-screened for exclusion criteria and invited to participate in the study during their regularly scheduled clinic visit with a pharmacist in an ambulatory care clinic. Pharmacist providers will obtain verbal informed consent and administer a survey which includes a single question validated to determine level of health literacy and other questions designed to collect information on demographics, ED visits/hospitalizations, severe hypoglycemic episodes, diabetes education, and years with diabetes. The investigators will then perform chart reviews to look for documentation of diabetes-related complications. Subjects will be divided into one of three groups, adequate, marginal, or inadequate health literacy, based on the answer to the multiple-choice question. Differences in outcomes between groups will be assessed.

Results:
Results are pending.

Learning Objectives:
- Identify barriers to proper glycemic control in diabetes patients with low health literacy.
- Discuss ways to decrease risk of hypoglycemia in diabetes patients with low health literacy.

Self Assessment Questions:
- A diabetes patient with low health literacy will likely:
  A: contact health care provider with acute issues.
  B: be able to identify diabetes-related complications.
  C: have difficulty managing his or her medication regimen.
  D: appropriately treat hypoglycemic episodes.

Which of the following can help reduce severe hypoglycemic episodes in patients with lower health literacy?
- A: Aggressively target tight glucose control
- B: Allow patients to self-adjust insulin regimens
- C: Use less-intensive regimens with medications likely to cause hypo
- D: Wait for patient to report adverse events before any follow-up is sc

Q1 Answer: C  Q2 Answer: C

ACPE Universal Activity Number 121-999-11-206 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
BACKGROUND: The incidence of patients who are overweight or obese is rising in all patient populations. Metabolic syndrome includes factors such as abdominal obesity, dyslipidemia (elevated triglycerides, low HDL cholesterol), raised blood pressure, and insulin resistance. This is especially important in psychiatric patients due to the increased risk of adverse metabolic effects of many antipsychotic agents used to treat psychiatric illnesses. Lifestyle factors associated with metabolic syndrome, such as smoking, inadequate exercise, poor diet, and being overweight are more prevalent in patients with mental illness. The goal of this project is to develop a successful metabolic syndrome monitoring program for all patients admitted to a state psychiatric hospital.

METHODS: This is prospective, single-center, cross-sectional study. The anticipated sample size is 400. Demographic variables (age, gender, race) will be collected. All patients admitted to the hospital for a six-month period will be screened by the Pharmacy Department for metabolic syndrome. If required for completion of screening, the Pharmacy Department will contact the provider via the intervention system to request lab work or measurements. If results of the screening indicate metabolic syndrome, a worksheet is sent to the provider with general recommendations (add diagnosis of metabolic syndrome, smoking cessation, pharmacologic treatment of certain disorders). The provider then reviews and comments on the worksheet and sends it back to the Pharmacy Department. Statistical analysis will be performed on the collected data and the specific tests that will be used are to be determined. Exclusion criteria: If a patient is admitted, discharged, and then re-admitted during the study time frame, only data from their first admission will be used.

RESULTS/CONCLUSIONS: Data collection and analysis is currently in progress and will be presented at the Great Lakes Pharmacy Resident Conference 2011.

Learning Objectives:
Discuss metabolic syndrome and the implications it has on patients with psychiatric disorders. Report the outcomes of a pharmacist-managed metabolic syndrome monitoring program. 

Self Assessment Questions:
In order to meet the ATP III criteria for metabolic syndrome, patients must have at least how many of the 5 criteria found positive?
A: 2
B: 3
C: 4
D: 5

Patients with psychiatric disorders have an increased risk for metabolic syndrome due to many factors, such as:
A active lifestyle
B healthy diet
C use of atypical antipsychotic medications
D drinking lots of water

Q1 Answer: B Q2 Answer: C

EVALUATION OF THE REVERSAL OF ORAL ANTICOAGULATION-INDUCED INTRACREREBRAL HEMORRHAGE
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BACKGROUND: The incidence of patients who are overweight or obese is rising in all patient populations. Overweight and obesity is defined as having a body mass index (BMI) of 25 kg/m² or greater. This is especially important in psychiatric patients due to the increased risk of adverse metabolic effects of many antipsychotic agents used to treat psychiatric illnesses. Lifestyle factors associated with metabolic syndrome, such as smoking, inadequate exercise, poor diet, and being overweight are more prevalent in patients with mental illness. The goal of this project is to develop a successful metabolic syndrome monitoring program for all patients admitted to a state psychiatric hospital.

METHODS: This is prospective, single-center, cross-sectional study. The anticipated sample size is 400. Demographic variables (age, gender, race) will be collected. All patients admitted to the hospital for a six-month period will be screened by the Pharmacy Department for metabolic syndrome. If required for completion of screening, the Pharmacy Department will contact the provider via the intervention system to request lab work or measurements. If results of the screening indicate metabolic syndrome, a worksheet is sent to the provider with general recommendations (add diagnosis of metabolic syndrome, smoking cessation, pharmacologic treatment of certain disorders). The provider then reviews and comments on the worksheet and sends it back to the Pharmacy Department. Statistical analysis will be performed on the collected data and the specific tests that will be used are to be determined. Exclusion criteria: If a patient is admitted, discharged, and then re-admitted during the study time frame, only data from their first admission will be used.

RESULTS/CONCLUSIONS: Data collection and analysis is currently in progress and will be presented at the Great Lakes Pharmacy Resident Conference 2011.

Learning Objectives:
Discuss metabolic syndrome and the implications it has on patients with psychiatric disorders. Report the outcomes of a pharmacist-managed metabolic syndrome monitoring program. 

Self Assessment Questions:
In order to meet the ATP III criteria for metabolic syndrome, patients must have at least how many of the 5 criteria found positive?
A: 2
B: 3
C: 4
D: 5

Patients with psychiatric disorders have an increased risk for metabolic syndrome due to many factors, such as:
A active lifestyle
B healthy diet
C use of atypical antipsychotic medications
D drinking lots of water

Q1 Answer: B Q2 Answer: C

ACPE Universal Activity Number 121-999-11-293 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
IMPACT OF ANTIMICROBIAL PROPHYLAXIS ON INFECTION RATES POST TOTAL HIP AND KNEE ARTHROPLASTY

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Title: Impact of antimicrobial prophylaxis on infection rates post total hip and knee arthroplasty

Background: Surgical site infections following total hip and knee arthroplasty can be a devastating complication leading to patient injury, morbidity, and health care costs. At our institution, post operative surgical site infection rates have remained above internal benchmarks for patients who received total hip and knee replacement procedures. The purpose of this study is to evaluate the impact of antimicrobial prophylaxis regimens on the type and incidence of deep surgical site infections in patients who have undergone total hip or knee arthroplasty.

Methods: A report was generated from the Quality Assurance Infection Control database that identified patients who underwent total hip and knee joint replacement procedures at University of Toledo Medical Center from January 1, 2006 to December 31, 2009. A retrospective chart review was performed on patients who met defined criteria for deep surgical site infection of the hip or knee joint. Patients with a surgical site infection in a hip or knee joint that had undergone revision, an infection recurrence, or a superficial surgical site infection were excluded. Of the 1492 patients screened, 31 patients qualified for retrospective chart review. Data collected and evaluated from patient medical records includes demographic information, past medical history, medication history, antimicrobial prophylaxis regimen, type of arthroplasty, date of infection, and culture results.

Results: Post-operative deep surgical infection incidence is the primary outcome. The dose and timing of antimicrobial prophylaxis, choice of antimicrobial agent(s), number of post operative doses, and culture results will be assessed in relation to the primary outcome. Descriptive statistics will be expressed for all variables. A multiple logistic regression will be used to answer the study objective.

Learning Objectives:
Classify the types of surgical site infections.
Select an antimicrobial prophylaxis regimen recommended by American Academy of Orthopaedic Surgeons for hip and knee arthroplasty.

Self Assessment Questions:
A patient diagnosed with surgical site infection has radiologic evidence of abscess. Which type of surgical site infection does this patient have?
A: Organ/space
B: Incisional and superficial
C: Incisional and deep
D: Cellulitis

Which of the following is recommended by the American Academy of Orthopaedic Surgeons for antimicrobial prophylaxis of hip and knee arthroplasty?
A: Vancomycin in a patient with no known allergies
B: Cefazolin in a patient with no known allergies
C: Clindamycin in a patient with no known allergies
D: Levofoxacin in a patient with a beta lactam allergy

Q1 Answer: C, Q2 Answer: B

COMPUTERIZED PRESCRIBER ORDER ENTRY (CPOE) READINESS AT AN ACADEMIC MEDICAL CENTER

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Purpose: Froedtert Hospital is a 486-bed academic medical center preparing for implementation of computerized prescriber order entry (CPOE) in summer 2012. One of the first steps in this process is to identify potential obstacles for successful prescriber use of the system. The purpose of this study was to anticipate medication errors and resolve their causes prior to the initiation of CPOE.

Methods: Written orders requiring pharmacist clarification were collected over a period of two weeks in the fall of 2010 from pharmacists providing services to inpatient nursing units, the emergency department and the operating room. Orders that needed clarification due to route, dose, frequency, drug formulation, duration of therapy, strength, illegibility, inappropriate abbreviation, no signature, no patient name and wrong patient errors were included. Medication orders adjusted for clinical factors or errors as a result of incorrect pre-printed order sets were excluded. Orders were categorized based on type of error and then entered into a test CPOE system to assess the presentation of these medications to the prescriber in a simulated order entry workflow.

Results: There were 482 orders collected and 331 orders met the inclusion criteria. Multiple prescribing errors on a single order occurred on 120 orders (36.3%). The most common prescribing errors were route (41.4%), incorrect or missing dose (25.1%, 21.1%) and frequency omitted (20.5%). Less frequently occurring errors included incorrect frequency, wrong medication or formulation and illegibility. Less than one percent of orders collected included inappropriate abbreviations or was missing prescriber signatures.

Conclusion: Conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:
List the most common prescribing errors.
Identify areas where a CPOE system can be enhanced to facilitate CPOE workflows.

Self Assessment Questions:
What was the most common prescribing error?
A: Incorrect dose
B: Route omitted
C: Incorrect frequency
D: Dose omitted

Which of the following is a required field in the CPOE workflow?
A: Patient's age
B: Patient's height
C: Medication frequency
D: Patient's vital signs

Q1 Answer: B, Q2 Answer: C

ACPE Universal Activity Number 121-999-11-393 -L04-P
ACPE Universal Activity Number 121-999-11-446 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5
**COMPARISON BETWEEN SINGLE 3MG AND WEIGHT BASED RASBURICASE DOSING IN THE TREATMENT OF TUMOR LYSIS SYNDROME IN ADULTS: THERAPEUTIC OUTCOMES.**

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**Purpose:**  
Tumor lysis syndrome (TLS) is a potentially life threatening oncologic emergency. Hyperuricemia due to nucleic acid catabolism characterizes the presentation of TLS. The current standard for prophylaxis is aggressive hydration and antihyperuricemic therapy. Allopurinol and rasburicase are two therapeutic alternatives currently available. Rasburicase is approved by the US Food and Drug Administration (FDA) for the initial management of hyperuricemia in oncology pediatric and adult patients. Rasburicase is a recombinant urate oxidase enzyme which facilitates the conversion of uric acid to allantoin; which is 5-10 times more soluble in urine than uric acid. Several studies have proposed different methods for rasburicase dosing, at lower doses and a shorter duration of treatment with potential savings. In the past, the general practice at University of Illinois Medical Center (UIMC) consisted of single weight based dosing approach of rasburicase (0.15 mg/kg). This practice was changed to the use of rasburicase 3 mg single flat dose in 2008, which remains the current dosing guideline at our institution. The purpose of this study is to determine if the current guidelines for the treatment and prevention of TLS associated hyperuricemia at UIMC with a single 3 mg dose of rasburicase have the same therapeutic outcomes when compared to previously used weight- based single dose approach.  

**Methods:**  
A retrospective chart review of all adult patients (≥18 years) treated with rasburicase at UIMC from 1/1/2002 to 9/19/2010 will be conducted. Data to be collected includes: demographical data (date of birth, age, sex, race, weight, height), relevant laboratory parameters, co-morbidities, cancer diagnosis, tumor stage, chemotherapy regimens and concurrent TLS treatment and medications.  

**Results:**  
Data collection for this study is ongoing  
Conclusions:  
Research is currently in progress and conclusions based on the results of this study will be presented at the Great Lakes Pharmacy Residency Conference.  

**Learning Objectives:**  
Recognize the clinical presentation of tumor lysis syndrome and the current treatment strategies used.  
Describe the controversy associated with rasburicase dosing and evaluate the clinical literature available on this topic.  

**Self Assessment Questions:**  
Tumor Lysis Syndrome is an oncologic emergency characterized by which of the following:  
A: An increase in phosphorus, calcium, uric acid and decrease in pot  
B: An increase in phosphorus, uric acid, potassium and decrease in c  
C: An increase in uric acid, calcium, potassium and decrease in phos  
D: An increase in calcium, potassium, phosphorus and decrease in u  
The rasburicase dosing approved by the FDA and included in its package insert is:  
A: 6 mg IVPB over 30 minutes one time only  
B: 4.5 mg IVPB over 1 hour daily for up to 5 days  
C: 3 mg IVPB over 1 hour one time only  
D: 0.15-0.2 mg/kg IVPB over 30 minutes daily for up to 5 days  
Q1 Answer: B  
Q2 Answer: D  
ACPE Universal Activity Number  121-999-11-075 -L01-P  
Activity Type: Knowledge-based  
Contact Hours: 0.5  

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**DELIRIUM ASSESSMENT PILOT PROGRAM IN A BURN UNIT**

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**PURPOSE**  
Delirium is defined as a disturbance of consciousness with inattention accompanied by a change in cognition or perceptual disturbance that develops over a short period and fluctuates over time. Delirium is a common occurrence in the hospital and is associated with increased health care costs due to increases in length of stay, ventilator days, and higher mortality rates.  
The incidence of delirium is under-recognized in routine clinical practice. Recently, the Confusion Assessment Method for the ICU (CAM-ICU) screening tool has been initiated as part of routine care and assessment of patients in all of the ICUs at Wishard Health Services (WHS) except for Burn. The objective of this IRB approved pilot study is to quantify the incidence of and factors related to delirium in burn patients for the purpose of developing a treatment protocol.  

**METHODS**  
WHS is the county hospital providing care to the indigent population of Marion County. The Richard M. Fairbanks Burn Unit is certified by the American College of Surgeons and the American Burn Association and consists of 11 intensive care patient rooms. Patients eligible for delirium screening [Richmond Agitation and Sedation Scale (RASS) greater than or equal to -3, age greater than or equal to 18] will be assessed for delirium by completing a CAM-ICU. Delirium screenings will be performed daily for a duration of 4 weeks to assess for the primary endpoint of delirium incidence. Secondary endpoints will include; percentage of patients with documented delirium on discharge summary use of antipsychotics; use of benzodiazepines; use of anticholinergic drugs; and recognition of hospital-acquired complications (e.g. mechanical ventilation, catheters, central lines, and restraints). This data will be used to develop a standardized delirium screening and treatment protocol for use in the WHS Burn Unit. The development and implementation phases are not included in this pilot study.  

**RESULTS**  
Pending.  

**Learning Objectives:**  
Recognize the risk factors associated with delirium.  
Recall the data utilized when assessing for delirium.  

**Self Assessment Questions:**  
Which of the following is a risk factor for delirium?  
A: prolonged length of stay  
B: vitamins  
C: anticholinergic medications  
D: A & C  
All of following data are used when assessing for delirium EXCEPT:  
A: Retrospective chart review to determine medications PTA, PMH, ε  
B: CAM-ICU screening  
C: Family interview to determine if patient has an underlying psychiat  
D: Documentation of medications during hospitalization  
Q1 Answer: D  
Q2 Answer: C  
ACPE Universal Activity Number  121-999-11-155 -L01-P  
Activity Type: Knowledge-based  
Contact Hours: 0.5
A PROSPECTIVE EVALUATION OF THE RELATIVE DOSE INTENSITY OF SYSTEMIC CHEMOTHERAPY AT SPARROW REGIONAL CANCER CENTER

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Purpose:
Relative dose intensity (RDI) is the ratio of dose intensity delivered to the standard dose intensity of the chemotherapy regimen. Adherence to scheduled dose intensity (DI) has suggested improved outcomes and survival, particularly for RDIs > 85% in patients with breast cancer. A retrospective evaluation at Sparrow Regional Cancer Center (SRCC) determined RDI to be 83%. In an attempt to improve the RDI at SRCC, two quality improvement initiatives were designed and implemented.

The primary objective of this evaluation is to prospectively determine the RDI of systemic chemotherapy after implementation of quality improvement initiatives and compare these results to the RDI retrospectively. Secondary objectives include assessing compliance of a febrile neutropenia risk assessment tool and chemotherapy dose cancellation policy.

Methods:
A prospective chart review was conducted of patients > 18 years old with newly diagnosed cancers of the breast, lung, ovary, colon or lymphoma starting systemic chemotherapy. Data collection included name, height, weight, date of birth, hospital ID, diagnosis, staging, progression, lab values, prognosis, chemotherapy regimen, and use of a febrile neutropenia risk assessment tool. DI calculations were performed for each chemotherapy agent by dividing total delivered dose by total treatment time. RDI was calculated for individual chemotherapy agents and the average was calculated for each chemotherapy regimen. To evaluate compliance of previously implemented quality improvement initiatives, eligible patients were assessed for appropriate use and compliance of a febrile neutropenia risk assessment tool. In addition, a two-month follow up evaluation was conducted of all cancelled chemotherapy appointments to assess adherence to a chemotherapy dose cancellation policy. Prospective results were evaluated using descriptive statistics. RDI prospective and retrospective data will be compared using Fishers exact test for nominal data and Wilcoxon rank sum for continuous data.

Results/Conclusions:
Data collection is ongoing. Preliminary results and conclusions will be presented.

Learning Objectives:
Explain the relationship between relative dose intensity and survival outcomes in patients with cancer.
Discuss the role of granulocyte colony-stimulating factors as prophylaxis for febrile neutropenia and supporting the delivery of myelosuppressive chemotherapy.

Self Assessment Questions:
In a 20 year follow-up study performed by Bonadonna et al, survival outcomes in patients with breast cancer were similar to the control group when patients received planned chemotherapy doses less than
A: < 45%
B: < 55%
C: < 65%
D: < 75%
The use of granulocyte colony-stimulating factors as primary prophylaxis is recommended for chemotherapy regimens associated with a risk of febrile neutropenia greater than or equal to which of the following:
A: > 10%
B: > 20%
C: > 30%
D: > 40%
Q1 Answer: C Q2 Answer: B

SAFETY AND EFFICACY OF ENOXAPARIN FOR PROPHYLAXIS OF VTE IN PATIENTS RECEIVING RENAL REPLACEMENT THERAPY

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Purpose:
The ACCP guidelines for prevention of venous thromboembolism do not include specific dosing adjustments for enoxaparin in patients undergoing renal replacement therapy. Patients with chronic kidney disease are at risk of accumulating enoxaparin when it is given in fixed doses at regular intervals, which may increase bleeding risk. This study will compare the rates of bleeding and venous thromboembolism in patients receiving prophylaxis doses of enoxaparin and either intermittent hemodialysis, continuous renal replacement therapy, or no renal replacement.

Methods:
This retrospective, single-center case-control study is approved by the health system's Institutional Review Committee and Scientific Review Committee. The health system's electronic database will be used to identify patients who received prophylactic enoxaparin and either hemodialysis, continuous renal replacement, or no renal replacement. Researchers will record patient demographics, enoxaparin doses and duration, other anticoagulant doses and duration, serum creatinine, hemoglobin and hematocrit, platelet count, blood products infused, bleed type and location, venous thromboembolism location, and hemodialysis type and duration. Patients in the renal replacement groups who received other anticoagulants or antiplatelets will be matched with patients who received those same medications and enoxaparin doses in the no renal replacement group. Exclusion criteria include: patients receiving peritoneal dialysis, patients with bleeding at a surgical site, patients who developed a bleed or venous thromboembolism while receiving warfarin. Patients with the following clotting disorders will also be excluded: acquired clotting deficiency due to liver disease or vitamin K deficiency, any congenital clotting factor disorder/deficiency, any deficiency syndrome, hemorrhagic disorder due to intrinsic circulating anticoagulants, and coagulation deficiency due to a vitamin K antagonist. The incident rates of bleeding and thromboembolism will be compared between the three groups. Researchers will also compare baseline characteristics and lab values to determine statistically significant differences between the three groups.

Results and Conclusions:
To be presented

Learning Objectives:
State the dosing recommendations for using enoxaparin in patients with renal impairment.
Name the recommended laboratory test for monitoring enoxaparin activity in patients with renal dysfunction.

Self Assessment Questions:
Which of the following is the correct dosage adjustment of subcutaneous enoxaparin for VTE prophylaxis in patients on intermittent hemodialysis?
A: Enoxaparin 40 mg daily
B: Enoxaparin 30 mg daily
C: Enoxaparin 30 mg after each hemodialysis session
D: Enoxaparin is not FDA approved for use in dialysis patients

Which of the following laboratory tests is recommended for estimating the activity of enoxaparin?
A: Prothrombin time
B: Anti-Xa level
C: Platelets
D: D-dimer
Q1 Answer: D Q2 Answer: B

ACPE Universal Activity Number 121-999-11-118-L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
EVALUATING THE CHANGE IN EFFICACY AND TOXICITY OF SLO-NIACIN COMPARED TO NIASPAN FOLLOWING CONVERSION

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Purpose:
Assess the change in patients' fasting lipid profile (FLP) and liver function test (LFT) following conversion of Niaspan to Slo-Niacin.

Methods:
A five-month retrospective analysis is being conducted at the Battle Creek Veterans Affairs Medical Center (VAMC) primary care facility to assess the change in patients fasting lipid profiles (FLP) and liver function tests (LFT) following conversion of Niaspan to Slo-Niacin. Subjects who took up to 2000 mg of Niaspan were automatically switched to Slo-Niacin using a milligram to milligram conversion by filling all new Niaspan orders and refill requests with Slo-Niacin. A patient letter was sent to each patient informing them of the conversion. All patients taking Niaspan who were converted to Slo-Niacin with a FLP and LFT prior to medication conversion were considered for evaluation. The patients were identified using an electronic database query search and data was reviewed by using the facility’s computerized patient record system. Providers were notified prior to the conversion of the medication change as well as after patients were converted so labs could be monitored six weeks after conversion. The aspartate transaminase, alanine transaminase, low-density-lipoprotein cholesterol, high-density-lipoprotein cholesterol, triglyceride, and total cholesterol values during Niaspan therapy were compared with the same values following conversion.

Results/Conclusions:
An estimated 800 patients will be converted from Niaspan to Slo-Niacin between November 1, 2010 and April 1, 2011. All patients converted will be evaluated for inclusion in this study. As of January 14, 2011 a total of 345 patients have been converted from Niaspan to Slo-Niacin. Final results and conclusions are to be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Explain the difference between the individual niacin formulations. Describe any dissimilarity in efficacy and toxicity between Niaspan and Slo-Niacin.

Self Assessment Questions:
How many extended-release niacin products are available on the market?
A 1
B 2
C 3
D 4

Which niacin formulation has the highest rate of hepatotoxicity?
A Immediate-release niacin
B Extended-release niacin
C Sustained-release niacin
D Timed-release niacin

Q1 Answer: A Q2 Answer: C

THE EFFECT OF A DIAGNOSIS OF A DEPRESSIVE DISORDER ON MONITORING, CONTROL AND MANAGEMENT OF PATIENTS WITH TYPE 2 DIABETES MELLITUS

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Purpose: Depression occurs at a high rate in patients with diabetes mellitus and has been associated with non-adherence to diabetic treatment. The objective of this study will be to assess the impact of co-morbid depression on management and control of type 2 diabetes mellitus (DM-2).

Methods: A retrospective chart review of patients seen at the Internal Medicine Center of Akron (IMCA) between 11/01/2009 and 10/31/2010 was conducted. Included patients had at least two appointments within the study period and a diagnosis of type 2 diabetes mellitus. Exclusion criteria included a mood disorder other than a depressive disorder, psychotic disorders, residence in a long-term care facility, or a new diagnosis of DM-2. Patients were then divided into two groups; those with DM-2 and depression and those with DM-2 without depression. Collected data included: age, gender, race, body mass index, duration of DM-2, duration of depressive disorder, use of antidepressant agents, use of insulin therapy, anti-diabetic medications, all A1C, low density lipoprotein (LDL) and blood pressure measurements during the study period, the number of appointments, whether the patient was seen in the diabetes clinic at IMCA, and prescription of standard recommended therapy at the end of the study period. The primary endpoint will be the percentage of patients in each group with at least one completed A1C, fasting lipid panel, and urine microalbumin. Secondary endpoints include the percentage of patients in each group with a goal A1C or LDL at the end of the study period, the average A1C and LDL, the percentage of patients with ≥50% of blood pressure readings at goal, and the number of patients in each group being prescribed standard recommended therapy at their last visit.

Summary and Conclusions: Data analysis in progress with results to be presented.

Learning Objectives:
Describe the effects that depression can have on a patient with type 2 diabetes. Recognize the prevalence of depression in the diabetic population.

Self Assessment Questions:
Which of the following can be affected by depression in a patient with type 2 diabetes?
A Motivation to perform self care activities such as foot inspections
B medication and diet compliance
C Patient/Physician relationships
D all of the above

Which of the following is true?
A The prevalence of depression in the diabetic population is equal to the general population
B Studies have shown a correlation between diabetes and depression
C Depression does not effect patient quality of life
D The prevalence of patients with concomitant depression is insignificant

Q1 Answer: D Q2 Answer: B

ACPE Universal Activity Number 121-999-11-105 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
EVALUATION OF VITAMIN K PRESCRIBING IN A COMMUNITY HOSPITAL
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Purpose: Vitamin K is effective when used for reversing the effects of warfarin. When a patient is prescribed too large of a dose of vitamin K, it can result in warfarin resistance, increasing the risk of thrombosis. The purpose of this study is to evaluate vitamin K prescribing and utilization of a protocol, based on the 2008 CHEST guidelines, at Franciscan Saint Margaret Health.

Methods: A medication use evaluation was performed. Patients were included if they received at least one dose of vitamin K between January and June 2010, and were over 18 years of age. Primary endpoints included utilization of the vitamin K protocol, appropriateness of vitamin K dose, route, and indication based on CHEST guidelines, and any adverse reactions. Secondary endpoints included timely restart of warfarin and therapeutic INR at the time of discharge.

Results: Fifty patients were evaluated with a total of 66 doses of vitamin K administered. Average age was 70 years and 48% were male. The protocol was used once. The most common dose was 10mg (78%), route was subcutaneous (65%), and indication was serious bleeding with an elevated INR (22%). Doses prescribed did not follow CHEST guidelines in 73% of patients. One patient was diagnosed with a new deep vein thrombosis after receiving vitamin K. Warfarin was resumed in 30 patients, and of these patients, 19 had a subtherapeutic INR at discharge, and 3 patients were sent home on bridge therapy.

Conclusions: Vitamin K was prescribed incorrectly in over 50% of patients. As a result of these errors, 62% of patients in whom warfarin was resumed were discharged with a subtherapeutic INR. A sub group analysis analyzing warfarin reinitiation, specifically time to therapeutic INR and length of stay, and education will be performed. Final results will be presented at GLPRC.

Learning Objectives:
Discuss the 2008 ACCP recommendations for use of vitamin K in the management of supratherapeutic INR due to warfarin.
Identify potential areas of improvement in vitamin K prescribing and administration in a community hospital setting.

Self Assessment Questions:
Intravenous route of vitamin K is preferred
A. When the INR ≥5 but <9 and there is no significant bleeding.
B. Life-threatening bleeding and an elevated INR
C. When INR is more than therapeutic range but <5.0 and there is no significant bleeding
D. When the INR is ≥9 and there is no significant bleeding

Subcutaneous administration of vitamin K
A. Is predictable and effective
B. Has delayed and erratic absorption
C. Is preferred over oral administration
D. Has an onset of 1 to 2 hours

Q1 Answer: B Q2 Answer: B

ACPE Universal Activity Number 121-999-11-151 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

BLOOD PRESSURE CONTROL IN TRAUMA PATIENTS
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There are no studies to date that directly examine the effects of inpatient blood pressure control in the trauma population. However, it is known that chronic hypertension can lead to increased mortality and severe cardiac and renal complications. In a previous study, patients hospitalized for acute severe hypertension who had chronic kidney disease experienced worse outcomes with respect to cardiac events and mortality than patients with better baseline kidney function. In another study, an inconsistent prescribing pattern of antihypertensive agents was observed for patients with acute severe hypertension. Of significance, it appeared that decreasing systolic blood pressure (SBP) by 20-25% within 6 hours of initiating IV therapy, consistent with the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7) Guidelines, was not always achieved. The purpose of this study is to determine whether inhospital episodes of hypertension in trauma patients lead to increased risk of complications such as cardiac events, renal dysfunction, and mortality.

This study is a retrospective chart review enrolling trauma patients 45-85 years old who were admitted to the Ohio State University Medical Center (OSUMC) between January 1 and September 30, 2008. Patients are being evaluated for in-hospital hypertension defined in two ways: at least one reading of SBP ≥180 and/or diastolic blood pressure (DBP) ≥110 and readings of SBP ≥160 and/or DBP ≥100 occurring on more than one occasion. The primary outcome will be the composite outcome of myocardial infarction (MI), stroke, venous thromboembolism (VTE), acute kidney injury (AKI) as defined by the Acute Kidney Injury Network (AKIN) classification scheme, and 28-day mortality.

Learning Objectives:
List possible complications of chronic hypertension.
Define the outcome measurements used in this study including the AKIN classification scheme.

Self Assessment Questions:
Which of the following is NOT a long-term complication of persistent hypertension?
A. Stroke
B. Myocardial infarction
C. Hepatitis
D. Kidney failure

Which of the following labs is used for the AKIN staging?
A. Serum potassium
B. Serum creatinine
C. Troponin
D. Blood urea nitrogen

Q1 Answer: C Q2 Answer: B

ACPE Universal Activity Number 121-999-11-368 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
MODIFICATION AND IMPLEMENTATION OF A MEDICATION RECONCILIATION PROCESS IN A PRIMARY CARE CLINIC
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Purpose:
The Joint Commission has mandated medication reconciliation as a national patient safety goal with the purpose to accurately and completely reconcile medications across the continuum of care. This goal encompasses every area of healthcare by including the phrase "across the continuum of care." Therefore, care of a patient in the primary care setting should be no exception. The primary objectives of this study were to (1) quantify baseline documentation of medication reconciliation and qualify the completeness of medication reconciliation within Family Medicine (FM) and Internal Medicine (IM) residency programs of St. Vincent Joshua Max Simon Primary Care Center (PCC), (2) survey the physicians and nurses attitudes toward medication reconciliation and barriers preventing 100% performance, and (3) measure changes in documentation post intervention. The secondary objective of this study was to determine provider and patient characteristics that may impact complete medication reconciliation.

Methods:
This IRB approved pre-post intervention retrospective chart review consisted of evaluating sixty electronic health records (EHR) pre- and post- intervention within the FM and IM residency programs. Patients were randomly selected for review to determine baseline medication reconciliation. "Medication reconciliation" was defined as 1) documentation in the EHR that reconciliation occurred at the time of office visit, and 2) "completeness" which included assessment of the following: allergy information, therapeutic duplication, drug interactions, dosing errors, omissions, medications without indications, and inactive medications. Physician and patient demographics were collected to determine if these characteristics affected rates of medication reconciliation. Physicians and nurses participated in an online survey to provide opinions for medication reconciliation improvement. Changes identified from baseline and survey data will be implemented to improve the reconciliation process. A second chart review will be conducted to assess if medication reconciliation has improved post intervention.

Results and Conclusions:
Final results with conclusions will be presented at the conference.

Learning Objectives:
Define the concept of medication reconciliation.
Discuss the importance of medication reconciliation.

Self Assessment Questions:
Medication reconciliation is defined as which of the following?
A Dispensing prescriptions and counseling patients
B Comparing reported medications to the medical record
C Collecting two patient identifiers from patients
D Discussing adverse events with patients and caregivers

Which of the following best explains the importance of medication reconciliation?
A Prevents medication errors
B Maximizes therapeutic duplication
C Measures patient compliance
D Identifies barriers to adherence

Q1 Answer: B Q2 Answer: A

Comparing Documented Pharmacist Activities with Physician Preferences and Expectations for Pharmacists Involvement in Patient Care
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Statement of Purpose:
Justification of clinical pharmacy services has become increasingly important when facing hospital expansions, increasing scrutiny on hospital expenditures, efforts to improve patient safety and quality of clinical services, and requests for cost-avoidance of clinical pharmacist interventions. With greater emphasis on safety and quality of patient care, the effective functioning of a multidisciplinary team is essential to maximize clinical outcomes. Currently, clinical pharmacists are responsible for direct patient care, medical and pharmacy education, and research, but do not have distributive pharmacy functions. By creating a method to document clinical interventions, Nationwide Childrens Hospital will be better equipped to explain clinical pharmacist workload and justify the value of clinical pharmacy services. Thus, comparing clinical pharmacist interventions with the patient care expectations of physicians is an important consideration for how the pharmacy department structures future workload for clinical pharmacists.

Statement of Methods Used:
Nationwide Childrens Hospital has instituted a new intervention tracking system in the electronic medical record for documentation of clinical pharmacist patient-specific medication interventions. Clinical pharmacists have begun documenting clinical interventions according to outlined requirements. A month of collected data from the specific intervention categories will be summarized and totaled for each clinical pharmacist. An institutional-review board approved opinion survey of hospital physicians, ranging from residents and to attending physicians, will access their expectations clinical pharmacist performance. Physician and patient demographics were collected to determine if these characteristics affected rates of medication reconciliation. Physicians and nurses participated in an online survey to provide opinions for medication reconciliation improvement. Changes identified from baseline and survey data will be implemented to improve the reconciliation process. A second chart review will be conducted to assess if medication reconciliation has improved post intervention.

Summary of (preliminary) results and conclusion: The results and conclusion of this study will be reported at the Great Lakes Residency Conference presentation in April 2011.

Learning Objectives:
Identify clinical intervention categories important in accurately reflecting clinical pharmacists workload.
Indicate differences between pharmacists clinical interventions compared to physician expectations of clinical pharmacists in providing direct patient care.

Self Assessment Questions:
Which of the following categories involved the least time (on average) for clinical pharmacists to complete?
A Renal dose evaluation
B Therapeutic drug monitoring
C Alternative therapy recommended
D Weans and tapers

Which of the following reasons warranted evaluation of clinical pharmacist interventions to help explain workload and justify value of clinical pharmacy services?
A Hospital expansion
B Improvements in patient safety
C Scrutiny around hospital expenditures
D All of the above

Q1 Answer: C Q2 Answer: D

ACPE Universal Activity Number 121-999-11-418-L04-P
Activity Type: Knowledge-based Contact Hours: 0.5
THE EFFECT OF COLESTIPOL ON GLYCEMIC CONTROL IN PATIENTS WITH TYPE 2 DIABETES MELLITUS
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Purpose: Despite the available evidence supporting the blood glucose lowering effects of colesevelam (Welchol) in type 2 diabetes, the specific effects of colestipol (Colestid) on glycemic control have yet to be evaluated. This study aims to evaluate the effect of colestipol on glycemic control in patients with type 2 diabetes mellitus in a veteran population. The primary efficacy endpoint is a change in HbA1c from baseline to follow-up after the initiation of colestipol. Secondary endpoints include percent change in lipid parameters and percentage of patients experiencing an increase in liver function tests (LFTs) from baseline to follow-up after initiation of colestipol. Additional secondary endpoints include the documentation of appropriate counseling regarding the proper administration of the medication, as well as the occurrence of adverse events related to the study medication.

Methods: This study will be a retrospective, electronic chart review of patients with an ICD-9 diagnosis of type 2 diabetes mellitus and an active prescription for colestipol at any time between January 1, 2005 and June 15, 2010. Patients aged 18 years and older with a diagnosis of type 2 diabetes mellitus and a prescription for colestipol will be included in the study. Study participants who have not been receiving treatment with colestipol for a minimum of 12 weeks will be excluded from this study. Additionally, patients with any changes in their antihyperglycemic medications during the 3 month period before or after the initiation of colestipol will be excluded. Patients will be followed throughout the study period and each subject will serve as their own control.

Results/Conclusion: Data collection and statistical analysis will be completed by April 2011. Final results with conclusion will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Discuss the current literature supporting the use of bile acid sequestrants for added glycemic control in patients with type 2 diabetes mellitus.
Identify whether colestipol demonstrates similar blood glucose lowering effects as colesevelam in patients with type 2 diabetes mellitus.

Self Assessment Questions:
Which of the following bile acid sequestrants is FDA indicated for adjunct treatment of type 2 diabetes mellitus?
A: Cholestyramine
B: Colesevelam
C: Colestipol
D: a and c

What is the main counseling point(s) for patients when initiating colestipol?
A: Common side effects of colestipol include constipation, abdominal
B: Take other medications 1 hour before or 4 hours after colestipol
C: Colestipol must be taken on an empty stomach
D: a and b

Q1 Answer: B  Q2 Answer: D

ACPE Universal Activity Number 121-999-11-083 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5

NEED FOR AND IMPLEMENTATION OF A PHARMACIST-LED TELEPHONE CLINIC ON SMOKING CESSATION
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Purpose: The VA population has historically a greater incidence of tobacco use, 43% in 2001. However, smoking in the VA population has decreased to match the general population, 19.7% vs. 19.8% in 2008. This decrease may be attributed to the 2003 VHA initiative that opened nicotine patch prescribing to primary care. The medication access aided many veterans, but proper follow-up and counseling may not be obtained. Currently, there is only a nurse practitioner at our facility providing in-person classes as the only option for smoking cessation counseling. Many patients are unable to attend and try to quit on their own. Data shows that combination of medication and counseling is far superior to either alone. This study will seek to evaluate the appropriateness of nicotine patch prescriptions from primary care and will examine outcomes. Based upon these results, the place for pharmacy services in provision of a telephone clinic may be defined.

Methods: Patients who filled nicotine patches at our facility from September 1 to November 30, 2010 will be evaluated. Patients will be excluded if they have patches provided by the Addictive Disorders Division. Investigators will access their medical record to obtain refill rates, progression to lower doses, incidence of side effects, and incidence of smoking relapse or cessation. Patient demographics, specifically age, gender, and race will be compiled. Past medical history will be examined specifically for COPD, lung cancer, MI, angina, arrhythmias, diabetes mellitus, and prie smoking cessation therapy. Social history will be examined to obtain smoking history and alcohol use. Descriptive statistics will be used for demographic data, number of adverse events, and medication persistence ratio. Alpha was set at 0.05 and to reach power of 80, a final sample size of 294 patients is required.

Results:
Results are pending and will be presented at Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Describe the current tobacco cessation services provided at the Chalmers P. Wylie VA ACC.
Identify the niche where pharmacy services may be implemented to aid tobacco cessation.

Self Assessment Questions:
A 2003 VHA Initiative opened nicotine patch prescribing to which area that was restricted previous
A: Mental Health
B: Addictive Disorders
C: Primary Care
D: Endocrinology

Which technique has been shown to be superior with regards to outcomes in smoking cessation?
A: Medications alone
B: Medications plus Counseling
C: Counseling alone
D: None of the above

Q1 Answer: C  Q2 Answer: B

ACPE Universal Activity Number 121-999-11-398 -L04-P
Activity Type: Knowledge-based  Contact Hours: 0.5
Purpose: Mechanical thrombectomy is used for the treatment of large-vessel acute ischemic stroke in patients who are ineligible for thrombolytic therapy, or in whom thrombolytic therapy has failed. Although effective at achieving reperfusion, there is a lack of data suggesting that functional and clinical outcomes are improved in patients treated with mechanical thrombectomy devices compared to those who receive standard medical therapy. The objective of this study is to evaluate functional and clinical outcomes associated with mechanical thrombectomy compared to standard medical therapy in acute ischemic stroke patients who are ineligible to receive thrombolytics.

Methods: Adult patients treated for acute ischemic stroke with mechanical thrombectomy were identified retrospectively via an institutional database. These patients were matched by NIHSS score and by anatomic location of stroke to a group of patients who received only standard medical therapy. Descriptive statistics were used to analyze demographic data.

Preliminary Results: Data was collected from 16 acute ischemic stroke patients who received mechanical thrombectomy. The average age was 62.16 and 50% of patients were female. On admission, the average NIHSS score was 197. Patients required a mean length of hospital stay of 10.25.7 days and a median length of ICU stay of 4.2(0.6-19.6) days. Fifty percent of patients experienced intracranial hemorrhage and of those, 25% occurred during the interventional procedure. Treatment of acute ischemic stroke with mechanical thrombectomy resulted in a 25% in-hospital mortality rate. A good clinical outcome, defined as a modified Rankin scale score ≤2 at discharge, was seen in 12.5% of this treatment group.

Preliminary Conclusion: In patients who are ineligible for thrombolytic therapy, or in whom thrombolytic therapy has failed, treatment of large-vessel acute ischemic stroke with mechanical thrombectomy is associated with high rates of intracranial hemorrhage and poor clinical outcomes.

Learning Objectives:
Review the treatment options for patients with acute ischemic stroke who are ineligible for intravenous thrombolytics or for whom intravenous thrombolytic therapy has failed.
Discuss efficacy and outcomes associated with the current alternative treatment options for acute ischemic stroke.

Self Assessment Questions:
The current treatment goal of acute ischemic stroke is:
A to restore blood flow, thereby minimizing damage to the brain
B aggressive thrombus extraction, and subsequent reperfusion of the vessel
C to maintain a low MAP, thereby minimizing perfusion to the damaged tissue
D to maintain a low core body temperature, thereby minimizing perfusion to the damaged tissue

The Merci retriever system and the Penumbra system have been granted clearance by the FDA for revascularization in patients with acute stroke within:
A 2 hours from onset of symptoms
B 4 hours from onset of symptoms
C 8 hours from onset of symptoms
D 12 hours from onset of symptoms

Which of the following is a beneficial outcome to aminoglycoside therapy optimization?
A Increased mortality
B Retained central venous catheters
C Decreased need for renal replacement therapy
D Extended length of stay

Q1 Answer: A  Q2 Answer: C

RESULTS/CONCLUSION: Results and conclusions to be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
List patient-specific factors that may lead to sub-optimal aminoglycoside dosing in pediatric patients with septic shock.
Discuss beneficial outcomes from optimizing aminoglycoside therapy in septic patients.

Self Assessment Questions:
A patient-specific factor that may lead to sub-optimal aminoglycoside dosing in pediatric patients with septic shock is:
A Rapid high volume fluid resuscitation
B Frequent lab draws
C Invasive blood pressure monitoring
D ICU status

Which of the following is a beneficial outcome to aminoglycoside therapy optimization?
A Increased mortality
B Retained central venous catheters
C Decreased need for renal replacement therapy
D Extended length of stay

Q1 Answer: A  Q2 Answer: C

ACPE Universal Activity Number 121-999-11-145 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
IMPACT OF A HEART FAILURE TRANSITIONAL CARE PROGRAM ON READMISSION RATES
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Purpose: The Chronic Heart Failure Quality Enhancement Research Initiative (QUERI) from the department of Veterans Affairs is focused on decreasing readmission rates for patients with heart failure due to the large economic burden and to increase patient outcomes. Improving the patient's transition of care from inpatient to outpatient is imperative. The purpose of this project is to assess the impact of a heart failure transitional care program on hospital readmission rates.

Methods: This study includes two parts. First is a retrospective chart review of patients that were discharged from Zablocki VA Medical Center from November 15th, 2008 to February 15th, 2009. Patients included were actively being treated for heart failure and discharged by the Cardiology team. Second, patients who are discharged from the Cardiology unit at the Zablocki VA Medical Center from November 15th, 2010 to February 15th, 2011 with a diagnosis of heart failure and are referred to the outpatient Heart Failure clinic will be included in the heart failure transitional care program. This program includes: patient education by the pharmacist prior to discharge, phone call follow up two to four days after discharge and an appointment in the heart failure clinic within seven days of discharge. Both groups of patients will be monitored for 30 days past their discharge date and readmission rates will be assessed during this time. The primary outcome includes the number of patients with heart failure readmitted within 30 days of discharge and the secondary outcome is the number of patients within 30 days of discharge with multiple readmissions. Readmission rates of each group will be compared.

Results/Conclusions: Data collection and evaluation remain in progress. Final results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Explain the importance of decreasing heart failure readmission rates. Describe interventions that may help to decrease rates of readmission in patients with heart failure.

Self Assessment Questions:
Which of the following factors contributes to the need to decrease heart failure readmission rates?
A decreased number of patients with heart failure
B cost of care is decreasing
C increased economic burden
D patient's satisfaction increases with readmissions

Which of the following interventions has been shown to reduce heart failure readmission rates?
A Patient education
B Monitoring patient's weight monthly
C Increasing patient's sodium intake
D Deviating from current heart failure guidelines

Q1 Answer: C   Q2 Answer: A

ACPE Universal Activity Number 121-999-11-15-L01-P
Activity Type: Knowledge-based   Contact Hours: 0.5

ADJUNCTIVE DEXMEDETOMIDINE THERAPY IN THE PEDIATRIC INTENSIVE CARE UNIT: A RETROSPECTIVE ASSESSMENT OF THE IMPACT ON SEDATIVE AND ANALGESIC REQUIREMENTS
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Background:
Dexmedetomidine is a selective α2-adrenoreceptor agonist approved by the FDA for the use in sedation of intubated and mechanically ventilated adult patients as well as for procedural sedation in non-ventilated adult patients. While not an approved indication, the current literature regarding dexmedetomidine use in the mechanically ventilated pediatric population is limited to a few prospective studies, small retrospective chart reviews, and case reports.

Purpose:
To investigate if dexmedetomidine, as adjunct to standard sedative therapy, reduces the duration of mechanical ventilation and results in less sedative and analgesic requirements in the community hospital pediatric intensive care unit population.

Methods:
For this IRB approved, retrospective chart review, pediatric intensive care patients were selected from the time period of January 1, 2008 through November 30, 2010. The study population was aimed at 80 pediatric intensive care patients, 40 patients in the standard sedative therapy group with dexmedetomidine and 40 patients in the standard sedative therapy group without dexmedetomidine. Inclusion criteria included male and female patients < 18 years of age who were admitted to the pediatric intensive care unit, required mechanical ventilation > 24 hours and < 30 days, and received continuous sedative, analgesic, neuromuscular blocker and/or anxiolytic therapy. Exclusion criteria included male and female patients ≥ 18 years of age, admission to the pediatric intensive care unit for a diagnosis of drug overdose, required mechanical ventilation < 24 hours or > 30 days, chronic ventilation prior to admission, or any patient with missing documentation of study data. Primary endpoints included the duration of time between initiation of sedative agents until successful extubation from mechanical ventilation and the percent change in sedative and analgesic requirements during dexmedetomidine use.

Results/Conclusions:
Data collection and analysis is ongoing. Results and final conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Select the dosing range that has been reported in the literature for the use of dexmedetomidine in sedation of mechanically ventilated pediatric patients.
Explain the impact of dexmedetomidine on adjunct medication utilization in mechanically ventilated pediatric patients, if presented with a patient case from a physician.

Self Assessment Questions:
In pediatric patients, dexmedetomidine has been used at dosing ranges of:
A 0.2 to 0.7 mcg/kg/hour
B 5 to 80 mcg/kg/minute
C 0.25 to 2.5 mcg/kg/hour
D 0.04 to 0.2 mg/kg/hour
During an infusion of dexmedetomidine, the utilization of adjunct medications such as opioids and benzodiazepines has been reported to have what effect?
A Adjunct medication utilization decreases, as compared to before in
B Adjunct medication utilization increases, as compared to before in
C Adjunct medication utilization stays the same, as compared to before
D Adjunct medication utilization has not been identified, as compare

Q1 Answer: C   Q2 Answer: A

ACPE Universal Activity Number 121-999-11-15-L01-P
Activity Type: Knowledge-Based   Contact Hours: 0.5
ASSESSMENT OF RATES OF ADHERENCE AND DRUG INTERACTION IN PATIENTS USING ORAL CANCER THERAPY

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Purpose: Oral cancer therapies have increased substantially as more oral agents are coming to market. Consensus guidelines specific to prescribing, educating and monitoring of oral cancer therapy is currently lacking. There is inconsistency in regard to patient education and little infrastructure to support adherence to therapy. Many oral cancer therapy agents have a high potential for drug interactions due to their metabolic pathways. Due to the current lack of guidelines, an oral cancer therapy program is being developed to address standardizing a process within our cancer center to enhance oral cancer therapy treatment. This investigation focused on assessing baseline characteristics of the patient population in order to evaluate the needs within our patient population in regards to adherence and safety of oral cancer therapies.

Methods: We conducted a single center, retrospective, observation analysis to assess baseline characteristics of our patient population in regards to medication adherence and rates of drug-drug interactions. This study is approved by the institutional review board. Outpatient pharmacy records from the University of Michigan database will be searched for patients filling any of the following agents: Imatinib, Capecitabine, Lapatinib, Lenalidomide, Sorafenib, Sunitinib, Erlotinib. Adherence rates will be determined by calculating medication possession ratios and cumulative multiple-refill gaps. Reasons for discontinuation and will also be analyzed. Institutional drug interaction programs will be run for patients profiles containing any of the seven above listed chemotherapeutic agents to access drug interaction rates. Rates of drug-drug interactions per patient will be calculated, stratified by severity of interaction.

Preliminary Results: Approximately 20% of fill intervals have a medication possession ratio of <90%. Thirty-two percent of patients had at least one drug interaction.

Conclusion: in progress

Learning Objectives:
Discuss medication adherence in cancer patients.
Review safety concerns with oral cancer therapy including medication errors and drug interactions with these agents.

Self Assessment Questions:
Which of the following is a potential impact of medication non-adherence
A Increased efficacy of the oral chemotherapy regimen
B Increased drug toxicity and adverse events
C Appropriate clinical assessment of disease response to drug therapy
D Increased access to the healthcare system

Which of the following is true regarding the safety of oral chemotherapy
A All cancer centers mandate the same elements to be included on a prescription
B Since the medications are oral, they do not share the adverse events
C Medication errors with oral cancer therapy occur along all stages of therapy
D National oncology organizations do not see the management of oral agents

Q1 Answer: B Q2 Answer: C

ACPE Universal Activity Number 121-999-11-497 -L05-P
Activity Type: Knowledge-based Contact Hours: 0.5

POPULATION PHARMACOKINETICS OF SIROLIMUS IN PEDIATRIC PATIENTS WITH NEUROFIBROMATOSIS TYPE 1

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PURPOSE
Sirolimus is an immunosuppressant which inhibits m-TOR, a key enzyme in the regulation of multiple cellular processes. Sirolimus efficacy was recently reported in the treatment of several tumor types, including pleomorphic neurofibromas characteristic of neurofibromatosis type 1 (NF1). The narrow therapeutic index and large interpatient variability in sirolimus pharmacokinetics make therapeutic drug monitoring beneficial for individualized dosing during chronic therapy. Factors responsible for pharmacokinetic variability are not well understood, and previous pharmacokinetic studies have not included pediatric patients with NF1. The objectives of this study are to 1) develop a pediatric population pharmacokinetic model, 2) identify factors associated with sirolimus clearance in pediatric patients with NF1.

RESULTS/CONCLUSIONS
Subsequently, the model may be evaluated as part of a Bayesian dosing algorithm.

METHODS
Sirolimus concentration-time data are from an ongoing prospective multi center clinical concentration-controlled trial in pediatric patients with NF1. The pharmacokinetics software package, MW/Pharm (MediWare, the Netherlands), will be used to perform iterative two stage Bayesian population pharmacokinetic analysis. This approach allows for the development of a population model, refined through the continual incorporation of new patient data. The program will generate individual and population pharmacokinetic parameter estimates; the primary outcome parameter will be sirolimus clearance. The relationships between clearance and age, sex, weight, body surface area, and lean body mass will be determined. Linear regression, parametric and nonparametric tests will be applied where appropriate.

RESULTS/CONCLUSIONS
Data of 44 subjects with NF1 will be included in the population analysis. Median subject age is 7.5 years (range, 3-18), with a median weight of 21.8 kg (range, 12-85.8). We expect to expand knowledge of patient-specific factors that influence sirolimus clearance in the pediatric population. These data will contribute to individualized dosing strategies to minimize under- and over-exposure to sirolimus in the treatment of NF1. Results and conclusions will be presented at the GLPRC.

Learning Objectives:
Discuss the potential advantages associated with identification and analysis of factors contributing to variability in sirolimus clearance. Describe the association of patient-specific factors with sirolimus clearance in individuals with neurofibromatosis 1.

Self Assessment Questions:
Which of the following are potential outcomes of identifying and modeling covariates for sirolimus clearance?
A Increased efficacy due to rapid achievement of target sirolimus concentration
B An increase in the number and degree of toxicities associated with increasing sirolimus concentration
C Decreased cost due to decreased need for therapeutic drug monitoring
D Both A & C

Which of the following is/are true about sirolimus pharmacokinetics?
A Sirolimus exhibits a high level of interpatient variability
B Sirolimus is a substrate of CYP3A4
C Sirolimus has a wide therapeutic range
D Both A & B

Q1 Answer: D Q2 Answer: D

ACPE Universal Activity Number 121-999-11-134 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
MEDICATION LIST BASED ON PATIENT PREFERENCE

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Purpose:
The primary aim of this study is to identify medication list components preferred by patients. Secondary aims include identifying the patients preferred medication list template, measuring change in patient knowledge and responsibility after using tailored medication lists, and assessing patient utilization of personalized medication lists.

Methods:
This study is a 12-week prospective pre- and post-survey conducted at a suburban anticoagulation clinic. Inclusion criteria are English speaking patients who are ≥18 years old and taking ≥8 medications. Cognitively or visually impaired patients will be excluded. Consenting subjects will complete a questionnaire composed of knowledge-based and perceived responsibility questions, along with questions aimed at identifying components preferred in a medication list. The patient will then be asked to choose a medication list from three example templates. The anticipated N is 50 subjects.

A medication list will be created from the list of preferences that the patient selected in the questionnaire and mailed to them. The post interview will be conducted approximately 30 days later either by phone or during the patients return to clinic. The patient will be re-tested on the knowledge questions and asked questions pertaining to the utilization of the personalized medication list they received at that time.

Results:
Results and conclusions will be presented at Great Lakes.

Learning Objectives:
Discuss the role of medication lists in patient care.
Identify the most preferred components of medication list identified by the patients in this study.

Self Assessment Questions:
1. In this study the patients were asked to pick from 3 medication templates, which was the most common template chosen?
   A: Template 1; simple form
   B: Template 2; intermediate form
   C: Template 3; in-depth form with pictures
   D: A template opposite the preferences selected in the questionnaire

Which of the following statements is correct?
   A: Patients who desired the more complex medication list had a good outcome.
   B: Patients who desired the more complex medication list did not have a good outcome.
   C: Patients did not desire the more complex medication list because.
   D: Patients that initially desired the more complex medication list did not have a good outcome.

Q1 Answer: B  Q2 Answer: B

EFFECT OF LOW-DOSE SPIRONOLACTONE ON HEMOGLOBIN A1C IN DIABETES PATIENTS

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Background
Aldosterone has long been known to increase blood pressure through regulation of sodium, water and potassium. More recently, it has been shown to affect the endocrine system through decreasing insulin signaling, resulting in impaired glucose utilization and increased production of glucose by the liver. Aldosterone effects on insulin signaling have been proven in vivo through decreasing the number of insulin receptors in the vasculature. This effect has also been supported through in vitro findings of increased insulin resistance in those with primary aldosteronism. It has since been hypothesized that blocking aldosterone effects may improve insulin signaling.

Purpose
This study was designed to determine if spironolactone counteracts aldosterone effects on the endocrine system, particularly insulin sensitivity. The primary endpoint is change in diabetes control as measured by a difference in hemoglobin A1c from baseline.

Methods
This is a prospective, randomized double-blind placebo controlled trial evaluating the effects of spironolactone 25mg on hemoglobin A1c compared to placebo in patients with uncontrolled diabetes mellitus defined as a hemoglobin A1c>7%. Patients are randomized to receive either spironolactone 25 mg or vitamin C 500 mg daily (placebo) for six months. All of the patients current diabetes medications remain the same and may continue to be adjusted by the patients healthcare providers as necessary. Safety endpoints include measuring potassium, serum creatinine, frequency of hypo/hyperglycemic episodes and blood pressure at baseline and set intervals throughout the study. Patients were removed if potassium >5.0, an increase in serum creatinine of >0.5, two or more blood sugars <60 mg/dL or >450 mg/dL or blood pressure of <100 mmHg systolic or <60 mmHg diastolic. Compliance and incidence of adverse effects were assessed during follow-ups at least monthly. Hemoglobin A1c was assessed at baseline, 3 months and 6 months.

Results
Preliminary results and conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:
Explain the mechanism and theory behind why spironolactone may affect blood glucose levels.
Describe the effect of spironolactone on hemoglobin A1c based on the study results.

Self Assessment Questions:
What is the main mechanism by which aldosterone has been shown to contribute to development and progression of diabetes?

A: Increasing GLP-1 production
B: Decreasing number of insulin receptors
C: Decreasing insulin production
D: Decreasing insulin signaling

Which factor listed below has been associated with increased aldosterone production?
A: Obesity
B: Smoking
C: Weight Loss
D: Hyperlipidemia

Q1 Answer: D  Q2 Answer: A

ACPE Universal Activity Number 121-999-11-171 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
Comparision of Clinical Outcomes in Veterans Receiving Antibiotics for Treatment of Osteomyelitis

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Background: Osteomyelitis is one of the oldest known infections; however, limited literature exists regarding the most effective antibiotics, the appropriate treatment duration, and clinical outcomes compared by route of administration. Existing studies vary in design and classify infection, treatment failure, and outcome measures, providing inconclusive information regarding the efficacy of various antibiotic agents, routes of administration, and the optimal duration of therapy to achieve a clinical cure.

Purpose: The purpose of this study is to retrospectively review treatment of osteomyelitis in patients at Jesse Brown VA Medical Center (JBVAMC). This study will compare clinical success rates of patients treated with intravenous versus oral antibiotic therapy and assess if an appropriate duration of therapy exists.

Methods: This study is a retrospective, electronic chart review of patients with a diagnosis of osteomyelitis during hospitalization at JBVAMC between January 1, 2006 and September 30, 2009 who received treatment with antimicrobial therapy. Patients included in this study are separated into the following 4 groups: patients who received 6 to 8 weeks of intravenous therapy; patients who received 6 to 8 weeks of intravenous therapy followed by treatment with oral therapy; patients who exclusively received oral therapy. Exclusion criteria includes noncompliance with antimicrobial therapy, severe peripheral vascular disease not surgically corrected prior to treatment, osteomyelitis with necrotizing fasciitis, infection due to Pseudomonas aeruginosa, or infection involving hardware. IRB approval was obtained prior to data collection. Data collection includes patient demographics, antimicrobial therapy, route of administration, microbiology results, and clinical outcomes defined as success or failure 12 months after completion of antimicrobial therapy.

Results/Conclusions: This study is currently in the data collection phase. Final results with conclusions will be presented at the Great Lakes Pharmacy Conference.

Learning Objectives:
Discuss the challenges in treating osteomyelitis.
Review the current recommendations for treatment of osteomyelitis.

Self Assessment Questions:
Which of the following statements is true:
A: Consensus guidelines exist for the treatment of osteomyelitis.
B: Osteomyelitis may recur months or years later after treatment with antibiotics.
C: Treatment of osteomyelitis requires a 2 to 4 week course of antibiotics.
D: Osteomyelitis is an infection involving skin and soft tissue only.

Treatment of osteomyelitis involves:
A: Amputation alone.
B: Debridement of wound alone.
C: Debridement of the wound (when appropriate) and antibiotics with poor bioavailability and bone penetration.

Q1 Answer: B Q2 Answer: C
COMPARING THE EFFICACY OF VASOPRESSIN AND NOREPINPHERINE FOR THE PREVENTION OF ACUTE KIDNEY INJURY IN PATIENTS WITH SEPTIC SHOCK.

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Severe sepsis affects approximately 750,000 patients each year, and is associated with high morbidity and mortality. Developing in approximately 50 percent of patients with septic shock, acute kidney injury (AKI) is a common complication. The purpose of this study is to determine whether vasopressin is non-inferior to norepinephrine, as a first-line vasopressor, for the prevention of AKI in patients with septic shock. This is an IRB approved, single-center, retrospective study. The health systems electronic medical record system and ICD-9 codes specific for septic shock, sepsis, bacteremia, pneumonia, and acute respiratory distress syndrome were utilized to identify adult patients who received either vasopressin or norepinephrine monotherapy for the treatment of septic shock. Patients who received vasopressor monotherapy for less than six hours, history of end-stage renal disease (ESRD) or AKI, receiving hemodialysis (HD), or with a baseline serum creatinine ≥ 4.0mg/dL were excluded. The primary outcome of the study is to identify the development of AKI during the first 48 hours of vasopressor therapy. Secondary outcomes to be collected include: mean cumulative urine output (ml/kg/hr), proportion of patients requiring continuous renal replacement therapy (CRRT), duration of CRRT, and proportion of patients progressing to ESRD or HD. Baseline characteristics and secondary outcomes will be analyzed using a chi-square or Fischers exact test for nominal data and Students t-test or ANOVA for continuous data. The non-inferiority margin is set at 25 percent assuming a 50 percent event rate for AKI in sepsis. Ninety patients in each treatment group were required to detect a statistical significance for development of AKI, with p-value < 0.05 and power of 80 percent. Complete results of the study will be presented at the residency conference.

We anticipate the results of this study will further inform clinical decision making for the selection of vasopressor agents for treatment of septic shock.

Learning Objectives:
Explain the pathophysiology of acute kidney injury in septic shock.
Discuss the results of this retrospective analysis comparing the efficacy of two vasopressors for the prevention of acute kidney injury in patients presenting with septic shock.

Self Assessment Questions:
What is the mechanism for acute kidney injury in septic shock?
A Renal ischemia secondary to hypotension
B Infammation
C Leukocytic infiltration of the glomeruli
D All of the above

What constitutes "Failure" in the RIFLE criteria for acute kidney injury?
A An absolute rise in serum creatinine of 1.5mg/dL from baseline or urine output (ml/kg/hr) ≥ 0.5
B An absolute rise in serum creatinine of 2mg/dL from baseline or urine output (ml/kg/hr) ≥ 0.5
C A increase in serum creatinine 2 times from baseline or urine output (ml/kg/hr) ≥ 0.5
D A increase in serum creatinine 3 times from baseline or urine output (ml/kg/hr) ≥ 0.5

Q1 Answer: D Q2 Answer: D

THE IMPACT OF PHARMACIST DISCHARGE MEDICATION RECONCILIATION ON 30-DAY READMISSION RATES

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Purpose
Since July 2009, the Centers for Medicare and Medicaid Services have added 30-day readmission rates for the same disease state as a quality indicator among hospitals. Decreasing 30-day readmission rates subsequently increases hospital quality of care and patient safety as well as reduces cost. Medication errors play a crucial role in the number of hospital readmissions. Many medication-related readmissions are likely preventable through interventions by clinical pharmacists. At Methodist Hospital of Indiana, current 30-day readmission rates for Internal Medicine patients are 16.16%. This study investigates the impact of clinical pharmacist-driven discharge reconciliation on 1) reducing 30-day readmission rates, 2) optimizing disease-specific therapy, 3) overcoming medication noncompliance and unaffordability.

Methods
Adult internal medicine patients at Methodist Hospital who are within 48-72 hours of being discharged are included in the study. Pharmacists and pharmacy students analyze these patients hospital records and review them for appropriateness of treatment based on current disease states, past medical history, and hospital course. Medications that lack an indication, have a drug interaction, have not been restarted on admission or are incorrectly dosed are addressed with the staff physician. Patients with a comorbidity with suboptimal therapy are also discussed with the staff physician. Patients receive counseling on any new medication that is started per recommendations. The numbers and types of clinical interventions prior to discharge are documented. Additionally, select patients who have been diagnosed with a chronic disease or have been started with chronic medications are contacted for outpatient follow up within 24-48 hours of discharge to review their medications and objectively assess their understanding of their therapy. The numbers and types of interventions are identified and documented. Thirty day readmission rates are assessed using admission records from the online Careweb system.

Results
Results will be presented at Great Lakes Conference.

Learning Objectives:
Recognize the impact that clinical pharmacist-driven discharge reconciliation has on 30-day hospital readmission rates.
Recognize the benefits of reducing 30-day readmission rates due to medications.

Self Assessment Questions:
Clinical pharmacists can help reduce 30-day readmission rates by doing all of the following except
A Counseling patients on their discharge medications
B Working with the attending physician to optimize outpatient therapy
C Starting patients back on all their home medications even if they are not taking them for appropriateness of treatment based on current disease states, hospital course. Medications that lack an indication, have a drug interaction, have not been restarted on admission or are incorrectly dosed are addressed with the staff physician. Patients with a comorbid condition with suboptimal therapy are also discussed with the staff physician. Patients receive counseling on any new medication that is started per recommendations. The numbers and types of clinical interventions prior to discharge are documented. Additionally, select patients who have been diagnosed with a chronic disease or have been started with chronic medications are contacted for outpatient follow up within 24-48 hours of discharge to review their medications and objectively assess their understanding of their therapy. The numbers and types of interventions are identified and documented. Thirty day readmission rates are assessed using admission records from the online Careweb system.

Q1 Answer: C Q2 Answer: D

ACPE Universal Activity Number 121-999-11-440 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5
EVALUATING THE IMPACT OF HEALTH LITERACY ON HEALTH OUTCOMES AND PATIENT PERCEPTIONS OF COUNSELING

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Objective: This purpose of this project is to explore the relationship of health literacy to the services offered by a community pharmacy. The objective are to assess the health literacy levels of pharmacy patients, to evaluate the relationship between health literacy and health outcomes in a community pharmacy disease management program, and to evaluate the relationship between health literacy and patient perceptions of counseling received at the pharmacy.

Methods: The project has been implemented at eighteen Kroger pharmacies located in Cincinnati, Ohio. General pharmacy patients and patients enrolled in pharmacist-provided disease management programs across eighteen pharmacy locations have completed the short Test of Functional Health Literacy in Adults (s-TOFHLA) and a survey consisting of questions assessing their opinions of counseling received at the pharmacy.

Using a survey adapted from the Agency for Healthcare Research and Quality (AHRQ) Pharmacy Assessment Tool, six of these pharmacies were evaluated on their ability to meet the needs of patients with low health literacy. The information obtained in this assessment was used to develop a health literacy training program for pharmacists reviewing indicators to help identify patients with inadequate health literacy and techniques to use when counseling such patients. After a one-month implementation period, the s-TOFHLA and perceptions survey were re-administered to patients at the selected pharmacies.

Results & Conclusions: Preliminary results will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
- Explain the difference between literacy and health literacy.
- Describe how the s-TOFHLA is used to assess health literacy.

Self Assessment Questions:
- Literacy refers to an individuals ability to function __________ while health literacy refers to an individuals ability to read and comprehend __________.
  - A: In an academic environment; prescription labels
  - B: On the job and in society; basic health and medical information
  - C: In an occupational environment; a medical chart
  - D: In an academic environment and in society; appointment slips and

As defined by the s-TOFHLA, a patient who is able to read, understand, and interpret most health texts would fall into which of the following health literacy categories?
- A: Inadequate
- B: Marginal
- C: Adequate
- D: Proficient

Q1 Answer: B  Q2 Answer: C

ACPE Universal Activity Number 121-999-11-425 -L04-P
Activity Type: Knowledge-based  Contact Hours: 0.5
EVALUATION OF THE IMPACT OF PHARMACIST TELEMEDICINE SERVICES ON EMERGENCY DEPARTMENT FOLLOW-UP IN A VETERAN POPULATION WITH DIABETES
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Background/Purpose: After an emergency department (ED) visit for a diabetes mellitus (DM)-related complaint, close follow-up is critical. An internal quality review has demonstrated a need for improved ED follow-up at the Jesse Brown VA Medical Center (JBVAMC). A pilot clinical pharmacist telemedicine service was implemented between August 1, 2010 and November 30, 2010. The goal of the pilot service was to increase adherence rates to recommended follow-up in patients seen in JBVAMC’s ED for a DM-related complaint. After pilot completion, there is a need to evaluate its impact. The purpose of this study is to compare the rate of adherence with follow-up in patients who received clinical pharmacist telemedicine services to patients who had not received the telemedicine services. The study will also compare the number of subsequent acute, unscheduled DM-related ED visits, urgent care visits, and hospital admissions within 45 days of the initial ED visit in patients who received clinical pharmacist telemedicine services to those who had not received telemedicine services.

Methodology: This study is a retrospective, electronic chart review of veteran patients who are at least 18 years of age and seen in JBVAMC’s ED between April 1, 2010 and November 30, 2010 for management of hyperglycemia, hypoglycemia, or provision of a medication refill request indicated for management of DM. Patients will be excluded if they are enrolled in the home-based primary care program at time of ED presentation, transferred to an outside hospital for inpatient admission, received care primarily from an institution other than JBVAMC, or whose electronic record lacked clear documentation. Charts will be evaluated for up to 45 days after the initial ED visit.

Results/Conclusions: Data collection and analysis are ongoing. Results and conclusions will be presented at the conference.

Learning Objectives:
Recognize the prevalence of diabetes mellitus in the United States.
Describe the patient centered medical home model.

Self Assessment Questions:
What percentage of the United States population is estimated to have diabetes mellitus?
A: 3.9%  B: 7.8%  C: 11.7%  D: 15.6%
Which of the following most accurately describes the purpose of the patient centered medical home?
A: Provision of eligible patients access to nursing homes in a timely f bility
B: Delivery of medications to patients’ homes
C: Team-based approach to improving patient outcomes through co operation of pharmacists and physicians
D: Creation of an extended care facility centered around educating patients
Q1 Answer: B  Q2 Answer: C

EVALUATION OF THE USE OF INTRAVENOUS VANCOMYCIN PRE AND POST IMPLEMENTATION OF INTERVENTIONS AT A COMMUNITY HOSPITAL.
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Background/Purpose
The rising emergence of resistant gram-positive bacteria is an international clinical problem leading to increased mortality. The use of vancomycin has been associated with the rise in vancomycin-intermediate and vancomycin-resistant bacteria. Inappropriate broad spectrum empiric therapy increases the risk of developing resistance by 50% to 60%. Previous studies report a wide range of inconsistent use of vancomycin. Antimicrobial stewardship programs (ASPs) are an effective strategy in decreasing antimicrobial use (22-36%) for both large teaching hospitals and small community hospitals. The objective of this study is to evaluate the prescribing patterns of intravenous vancomycin before and after the implementation of an ASP. The secondary objective is to identify key predictors of inappropriate and inappropriate use of vancomycin.

Methods
This study is an IRB-approved prospective, single center, interventional experiment. The 2 phases involve the evaluation of vancomycin prescribing patterns at baseline (June 1, 2010 to August 31, 2010) and after the interventions (October 1, 2010 to December 31, 2010). Implementation of the ASP occurred in September 2010. The vancomycin-use guidelines by HICPAC from CDC was modified with the most updated IDSA guidelines and approved by the infectious disease physician. The interventions included education of physicians and pharmacists on the modified guideline and prospective audits with feedback by pharmacists. Patients receiving intravenous vancomycin orders during the study period that were tracked through the central pharmacy were eligible for review. Patients who were pregnant, prisoners, and pediatrics were excluded. Patients given oral vancomycin and those with ambulatory treatment were also excluded. Vancomycin courses were categorized as appropriate or inappropriate based on the modified guideline. The primary endpoint was vancomycin appropriateness. The secondary endpoint determined predictors of inappropriate use to help assess patient populations and factors that may be indicative for more prudent use.

Results/Conclusion: To be presented at the Great Lakes Residency Conference.

Learning Objectives:
Review the intravenous vancomycin guidelines for appropriate use.
State the beneficial impact of antimicrobial stewardship on cost, resistance of bacteria, and appropriate use of antimicrobials.

Self Assessment Questions:
Which of the following is an appropriate use of intravenous vancomycin?
A: Treatment of infections caused by gram negative microorganisms
B: Treatment in response to a single blood culture positive for coagulase-negative staphylococci
C: Empiric and treatment for healthcare-associated pneumonia.
D: First line therapy for the empiric use for neutropenic fever.
What is a beneficial impact of antimicrobial stewardship programs (ASP)?
A: ASPs are an effective strategy in decreasing antimicrobial use.
B: ASPs are an effective strategy in increasing the emergence of resistance.
C: ASPs are an effective strategy in decreasing cost.
D: A and C
Q1 Answer: C  Q2 Answer: D

ACPE Universal Activity Number 121-999-11-540-L04-P
Activity Type: Knowledge-based  Contact Hours: 0.5
IMPACT OF PHARMACIST-PROVIDED COUNSELING ON 30-DAY READMISIONS IN HEART FAILURE PATIENTS

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Background:
Heart failure (HF) is a major economic burden. It is the most common and costly Medicare diagnosis-related group (i.e. hospital discharge diagnosis) and was estimated to cost the United States $39.2 billion in 2010. A review of UC Health - University Hospitals (UCH-UH) quality data revealed a higher than average 30-day readmission rate for HF.

Because of this, UCH-UH implemented the Pharmacist Education Program for Heart Failure (PEP-HF) and a nurse driven patient education program through Institute for Healthcare Improvement (IHI) in an effort to improve readmission rates in heart failure. Through PEP-HF pharmacists counseled patients on HF related medications, signs and symptoms of a HF exacerbation, what to do if symptoms worsen, weight monitoring, salt restrictions, fluid restrictions, activity level, and smoking cessation. The IHI initiative consisted of nurse-provided counseling which utilized IHI derived HF education materials, methods, and tools.

Purpose:
To evaluate the benefit of pharmacist-provided heart failure counseling and nurse-provided IHI counseling compared to usual care on preventing hospital readmission due to HF or hospital readmissions for any cause.

Methods:
The study is a retrospective, single-center, randomized, cohort review evaluating the impact of PEP-HF and the IHI initiative on 30-day readmission rates compared to usual care. Four patient groups were identified: 1) usual care plus pharmacist counseled (PEP-HF), 2) usual care plus IHI counseled, 3) usual care only on the Cardiac Stepdown unit (CSD) and Cardiovascular Intensive Care Unit (CVICU), and 4) usual care only on the cardiac telemetry unit. Usual care only consisted of counseling by a nurse at the time of discharge. The primary outcome measure is the number of 30-day readmissions for HF. The secondary outcome is the number of 30-day readmissions for any reason.

Summary of Results:
Data collection and analysis is ongoing and will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Discuss pharmacist and nurse-provided patient education for heart failure and their effects on hospital readmission rates.
Describe the economic burden and implications of heart failure readmissions.

Self Assessment Questions:
Pharmacist-provided heart failure patient education strives to improve quality of care and readmission rates by:
A. Decreasing the time nurses need to spend with the patient.
B. Increasing the revenue of outpatient pharmacy discharge prescriptions.
C. Expediting patient discharges from the hospital.
D. Promoting medication adherence through thorough medication co-prescribing.

Starting in fiscal year 2013, higher than expected 30-day readmission rates for heart failure may result in the Center for Medicare and Medicaid (CMS) to:
A. Withhold up to 1 percent of heart failure inpatient Medicare payments.
B. Withhold up to 1 percent of all inpatient Medicare payments.
C. Increase reimbursement by up to 1 percent of all inpatient Medicare payments.
D. Increase reimbursement by up to 1 percent of heart failure inpatient Medicare payments.

Q1 Answer: D Q2 Answer: B

IMPLEMENTATION OF A RISK EVALUATION AND MITIGATION STRATEGY (REMS) PROGRAM AFFECTING ERYTHROPOIESIS-STIMULATING AGENTS

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Purpose: Erythropoiesis-stimulating agents (ESAs), including epoetin alfa and darbepoetin alfa, have been associated with a variety of serious adverse events. In cancer patients, these agents have been linked with an increased risk of serious cardiovascular events, thromboembolic events, shortened survival, and/or increased risk of tumor progression or recurrence. Consequently, the Food and Drug Administration has developed a Risk Evaluation and Mitigation Strategy to govern the use of ESAs for oncology indications. The program requires that health care providers (HCPs) complete a training session and enroll in the ESA APPRISE (Assisting Providers and cancer Patients with Risk Information for the Safe use of ESAs) Oncology Program in order to prescribe ESAs for oncology patients. Additionally, they must provide risk-versus-benefit counseling and a Medication Guide prior to each new course of therapy and complete an acknowledgment form. Prescribers and institutions failing to comply will be denied access to ESAs. The primary objective of this project is to implement the program at Aurora hospitals and outpatient cancer clinics and optimize compliance prior to the mandatory implementation date of February 16, 2011.

Methods: HCP enrollment in the program was assessed and a list of enrolled providers was compiled. This list, in addition to the Medication Guides, acknowledgment forms, and workflow algorithms were disseminated. The program was implemented at Aurora St. Lukes Medical Center in December 2010. Following a compliance audit, changes were pursued to improve nursing access to required document and provide electronic reminders for HCPs regarding program requirements. All other hospitals and clinics implemented the program in January 2011. Compliance will be assessed twice in February. Subsequently, correction strategies will be pursued as needed and a final audit will be performed in March.

Conclusions: Data collection is in progress. Available results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Identify two adverse events associated with the use of ESAs to treat chemotherapy-associated anemia.
Describe the FDA requirements under the REMS program as it applies to oncology indications.

Self Assessment Questions:
Oncology patients receiving an ESA to treat chemotherapy-associated anemia are at an increased risk for experiencing which of the following adverse events?
A. Shortened survival and tumor progression
B. Shortened survival and liver dysfunction
C. Thromboembolic events and severe hypotension
D. Thromboembolic events and liver dysfunction

Which of the following describes actions prescribers enrolled in the ESA APPRISE Oncology Program must complete when using an ESA to treat chemotherapy-associated anemia?
A. Complete an acknowledgment form prior to each new cycle of chemotherapy.
B. Provide risk vs. benefit counseling, review Medication Guide, and administer.
C. Provide risk vs. benefit counseling and administer a standardized.
D. Provide risk vs. benefit counseling and review Medication Guide.

Q1 Answer: A Q2 Answer: B

ACPE Universal Activity Number 121-999-11-462 -L05-P
Activity Type: Knowledge-based Contact Hours: 0.5
EVALUATING TREATMENT OUTCOMES IN VENTILATOR-ASSOCIATED PNEUMONIA (VAP) DUE TO MULTIDRUG-RESISTANT ACINETOBACTER BAUMANNII (MDR-AB)

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Background
Acinetobacter baumannii has become a pathogen of increasing clinical importance over the course of the last several decades. Of particular concern is the high rate of antibiotic resistance observed for A. baumannii isolates. In the United States, multidrug resistance (MDR) in Acinetobacter spp. has increased considerably, increasing from 6.7% in 1993 to 29.9% in 2004. This dramatic increase in the prevalence of MDR is more than twice that observed for any other gram-negative bacillus causing infections in intensive care units. Despite these increasing rates of MDR and reports of pan-resistance emerging, there are no randomized controlled trials to establish optimal treatment of MDR-AB infections.

Purpose
The incidence of MDR-AB has been increasing at our institution and in the surrounding geographic area; it is most commonly seen in ventilator-associated pneumonia (AB-VAP). Tigecycline, doripenem, and colistimethate are agents commonly employed to treat resistant gram-negative organisms. However, at our institution, isolates do not undergo sensitivity testing for any of these three agents and clinicians must initiate therapy without knowing the minimal inhibitory concentrations (MIC) to these agents. The effectiveness of therapies for AB-VAP at our institution is not currently known. The objective of this study is to evaluate antibiotic treatments and clinical outcomes for AB-VAP.

Methods
This is a retrospective, electronic chart review of all hospitalized patients treated for ventilator-associated pneumonia (VAP) and having a respiratory culture for MDR-AB over a 36-month study period. Data to be recorded are as follows: demographic characteristics (age, gender), Acute Physiology and Chronic Health Evaluation (APACHE) II score at time of positive culture, empiric antibiotic therapy prior to positive culture, culture-directed antibiotic therapy after positive culture, serum creatinine documented nausea and/or vomiting during treatment, and death. Clinical outcomes and microbiological response will be evaluated.

Results
To be presented at the Great Lakes Residency Conference.

Learning Objectives:
Identify the common regimens used to treat multidrug-resistant Acinetobacter baumannii in ventilator-associated pneumonia. Describe how susceptibility information for clinical guidance might improve clinical outcomes and microbiological response.

Self Assessment Questions:
Identify the antimicrobial agents used to treat MDR-AB in this study.
A. Colistimethate, doripenem or tigecycline
B. Cefepime, pipercillin and tazobactam, or aztreonam
C. Levaquin, ertapenem, and gentamicin
D. Ampicillin or minocycline

Which statement below best describes the researchers’ recommendation for empiric therapy for suspected MDR-AB?
A. Acinetobacter species do not develop drug resistance and do not treat
B. Typical pseudomonas coverage is sufficient to treat MDR-AB
C. Early aggressive treatment yields the best treatment outcomes
D. Culture-guided antimicrobial therapy is not important

Q1 Answer: A  Q2 Answer: C

IMPLEMENTATION AND ASSESSMENT OF A PHARMACIST MANAGED INPATIENT WARFARIN PROTOCOL

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Purpose
The purpose of the project is to improve the quality of inpatient warfarin management through the implementation of a pharmacist managed warfarin protocol.

Objectives
Project objectives are to revise the current warfarin protocol and guideline, form a workgroup of pharmacists to review the proposed changes to daily workflows, develop clinical support tools, training materials, and to implement and assess the protocol.

Methods
The current protocol and guideline was revised to include pharmacist involvement in both inpatient warfarin management and transitioning the patient to the ambulatory setting. It was approved by the Pharmacy Practice Committee, Anticoagulation Task Force and Pharmacy and Therapeutics Committees. A workgroup of five pharmacists from different practice specialties (orthopedics/rehab, cardiology, general medicine) was formed. The workgroup reviewed the protocol, guideline, clinical support tools and training materials created in preparation for implementation. Clinical support tools were created to standardize documentation and assist with transitioning care. A live training program and interactive computer based training (CBT) program were created to assist in training the clinical pharmacist.

Each clinical pharmacist will be expected to complete one of the training programs with a passing score on the competency exam by the set implementation date. Protocol assessment and data collection will begin two weeks after protocol implementation.

Data collection will include a program capture rate, time to therapeutic range, time in therapeutic range, INRs resulting a critical value, administration of phytonadione to reverse supratherapeutic INRs, and bleeding events (minor, major, fatal). Measures of protocol adherence, including the percent of patients with baseline INR results prior to warfarin initiation, percent of patients with daily monitoring notes, and percent of patients with documented discharge instructions, will also be assessed. An internet based survey will be utilized to assess pharmacist satisfaction.

Learning Objectives:
State areas of patient care which can be improved through pharmacist management of warfarin anticoagulation. Describe methods which can improve the continuity of care for warfarin patients during the transition from inpatient to outpatient management.

Self Assessment Questions:
1. Which of the following should be included in the discharge communication between the inpatient setting and the outpatient setting?
A. A longitudinal record of every INR value for the patient
B. A record of the single most recent INR
C. A record of the single most recent warfarin dose
D. Target INR range and Indication for anticoagulation

Which of the following best describes the role of the pharmacist in managing warfarin therapy?
A. Pharmacist is only responsible for ordering the daily dose of warfarin
B. Pharmacist is responsible for assessing the patient daily in order to...
C. Pharmacist is responsible for ordering the daily dose of warfarin... D. Pharmacist is responsible for the inpatient management of warfarin

Q1 Answer: D  Q2 Answer: B

ACPE Universal Activity Number 121-999-11-068-L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
EVALUATION OF ANTICOAGULATION TREATMENT OUTCOMES IN ORTHOPEDIC SURGERY PATIENTS

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Evaluation of Anticoagulation Treatment Outcomes in Orthopedic Surgery Patients

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Purpose:
Prevention of venous thromboembolism (VTE) after total hip arthroplasty (THA) or total knee arthroplasty (TKA) is a standard of care in the acute post-operative phase. Treatment recommendations vary between professional organizations regarding agent of choice, treatment duration and goal INR range if warfarin utilized. Current practice at our institution is to give warfarin at a shorter duration and lower INR goal. This study is being conducted to determine patient outcomes with the current warfarin practice.

Methods:
This is a retrospective chart review of orthopedic surgery patients receiving warfarin for VTE prophylaxis from July 1, 2010 through January 1, 2011. Patients receiving warfarin for VTE prophylaxis post THA and/or TKA having INR management through the physician assistant or nurse practitioner of the orthopedic physicians at Methodist hospital are eligible for enrollment in this study. Pregnant females, patients less than 18 years of age, and prisoners were all excluded from this study. Data collected and analyzed includes: age, gender, starting dose of warfarin, dose titrations both inpatient and outpatient, inpatient and outpatient INR data, bleeding or thrombotic complications, and hospital readmission in the Indianapolis area.

Results/Conclusions: To be presented pending completion of data collection.

Learning Objectives:
Describe differences between the CHEST and American Academy of Orthopaedic Surgeons treatment guidelines for venous thromboembolism (VTE) prophylaxis post total knee arthroplasty (TKA) or total hip arthroplasty (THA).
Discuss appropriate warfarin starting doses and titration regimens in post-operative TKA and THA patients.

Self Assessment Questions:
Which of the following agents is not supported by the CHEST antithrombic guidelines as the sole method for thromboprophylaxis post THA or TKA?
- A low molecular weight heparins
- B warfarin
- C aspirin
- D fondaparinux

What is the goal INR range for warfarin thromboprophylaxis post THA or TKA supported by the American Academy of Orthopaedic Surgeons?
- A less than or equal to 2
- B less than or equal to 3
- C 2-3
- D 2.5-3.5

Q1 Answer: C Q2 Answer: A

COST IMPACT OF NEWLY ADOPTED PROTOCOLS FOR INPATIENT VANCOMYCIN MONITORING ON HEMODYNAMICALLY STABLE ADULT PATIENTS IN A COMMUNITY HOSPITAL

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PURPOSE: The practice of monitoring serum vancomycin levels with the goal of the prevention of nephrotoxicity has been a widely debated topic. The nephrotoxicity initially documented with vancomycin was most likely linked to the impurity of the preparation. The American Society of Health-System Pharmacists (ASHP), the Infectious Disease Society of America (IDSA), and the Society of Infectious Disease Pharmacists (SIDP) recently published a consensus review of therapeutic monitoring of vancomycin in adult patients. In the article they make recommendations for how often and what kind of levels should be used to monitor the hemodynamically stable patient that is not receiving aggressive dosing (defined as, targeted trough levels of < 15 mg/L). By adjusting the current practice of vancomycin monitoring to adhere to the recommendations set forth by the ASHP, IDSA, and SIDP, there should be associated costs and benefits. More research investigating the cost and effectiveness of implementing these guidelines is warranted.

METHODS: Observation study comparing patient data collected by the pharmacokinetic monitoring service over the periods of January-March for the last two years to the data collected from January-March of 2011 concerning adult vancomycin patients. Primary outcome is the direct cost associated with the new vancomycin monitoring protocol used by the pharmacy when consulted to dose vancomycin as compared to the previous practice of monitoring vancomycin. Secondary outcome is the observed occurrence of vancomycin-induced nephrotoxicity associated with the new vancomycin monitoring protocol as compared to the previous practice of monitoring vancomycin. Data will be collected by review of the pharmacokinetic monitoring forms filled out by a clinical pharmacist and also by examination of the pharmacy charts that are uploaded onto an electronic database.

RESULTS/CONCLUSIONS: Data collection and analysis are ongoing. Comprehensive results will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Identify the effect of the implementation of the ASHP, IDSA, and SIDP vancomycin monitoring guidelines on hospital and patient health care costs.
Discuss the impact that these changes are having on patient outcomes.

Self Assessment Questions:
ASHP, IDSA, and SIDP currently recommend monitoring of trough serum vancomycin concentration to reduce the risk of nephrotoxicity in which of the following patient populations?
- A Patients expecting to have to have less than a 3 day course of var
- B Patients with targeted troughs less than 15 mg/L.
- C Patients with elevated LFTs.
- D Patients receiving concurrent nephrotoxic agents.

The ASHP, IDSA, and SIDP define vancomycin-induced nephrotoxicity as:
- A A single increase of serum creatinine concentration of >0.5 mg/dL
- B At least 2 consecutive increases of serum creatinine concentration
- C At least 2 consecutive increases of serum creatinine concentration
- D At least 2 consecutive increases of serum creatinine concentration

Q1 Answer: D Q2 Answer: B

ACPE Universal Activity Number 121-999-11-261 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
EFFECTIVENESS OF A PHARMACY CARE MANAGEMENT PROGRAM FOR VETERANS WITH DYSLIPIDEMIA

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Objectives: The purpose of this study is to evaluate the effectiveness of care management provided by clinical pharmacists for veterans with dyslipidemia. This study compares dyslipidemia outcomes in veterans receiving care from a primary care clinic managed by clinical pharmacists to veterans receiving dyslipidemia care management in a primary care clinic without clinical pharmacy services.

Methods: The study will examine 225 patients followed for management of dyslipidemia by clinical pharmacists in one primary care team at the Richard L. Roudebush Veterans Administration Medical Center from June 1, 2007 to December 31, 2009. The study group will be compared to a control group consisting of 225 patients on a second primary care team without clinical pharmacy services. The primary endpoint is to determine the change in total cholesterol, LDL, HDL, and triglycerides from initial to final visits between each clinic. The secondary endpoints are to evaluate patients achieving their cholesterol goals, including the time to achieve goal, number of interventions, number of visits, and sustainability of cholesterol goals. Descriptive statistics will be used to evaluate the data. Nominal data will be evaluated using a McNemars correlation test. Nominal data in the study includes number of patients a goal in each group at the end of the study period, number of visits, number of interventions, and sustainability of cholesterol goals. Continuous data, including differences in cholesterol levels between the two study groups, will be evaluated using paired t-tests. Final results will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
List four lipid measurements and their respective differences in results between a primary care team managed by clinical pharmacists and a primary care team without clinical pharmacy services.
Describe two differences in the organization and follow up of dyslipidemia management in two different primary care clinics.

Self Assessment Questions:
Which statement has current literature made on the evaluation of interdisciplinary models for primary care patients being followed for treatment of dyslipidemia?

A: Patients are dissatisfied with dyslipidemia medications
B: Primary care teams are best operated by a single physician, workin
C: Dyslipidemia treatment outcomes are worsened by a team approa
D: More patients achieve goal cholesterol levels when managed by a

Which of the following statements is true regarding dyslipidemia follow up?
A: NCEP/ATPIII recommends 2 weeks of therapeutic lifestyle change
B: NCEP/ATPIII recommends follow up of fasting lipid profile 6 weeks
C: NCEP/ATPIII recommends treating triglycerides to goal before add
D: NCEP/ATPIII recommends treating patients with 0-1 risk factors to

Q1 Answer: D    Q2 Answer: B

IMPACT OF AN INSULIN ORDER SET AND EDUCATION PROGRAM ON INSULIN USE PATTERNS, GLYCEMIC CONTROL AND HYPOGLYCEMIA

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Purpose:
To determine if the implementation of a basal bolus insulin order set and a monthly physician inservice decreases the average daily blood glucose (BG) level in diabetic general medicine patients at the University of Louisville Hospital (ULH).

Methods:
This Institutional Review Board approved, retrospective study was conducted at ULH, a 400 bed tertiary care hospital. Patients were included if they were greater than 18 years of age, previously diagnosed with diabetes (Type I or II), admitted to the general medical service, scheduled to receive bedside glucose monitoring, and managed on insulin during their stay. The study was conducted in three phases. Phase 1 included a retrospective chart review of eligible patients. In phase 2, pharmacists provided monthly physician inservices regarding appropriate prescribing of basal bolus insulin. Phase 3 consisted of a post intervention chart review to re-evaluate the prescribing practices of physicians. The primary endpoint was the difference in average daily BG levels among patients receiving either SSI or basal bolus insulin. Several secondary endpoints were measured. These included the difference in the number of hyper and hypoglycemic episodes per day between the two treatment groups, and the impact the physician inservice had on basal bolus prescribing frequency (measured by change in the frequency of patients receiving SSI alone).

Results:
At the completion of Phase 1, 40% of the patients (n=50) were receiving SSI as their only form of diabetic therapy. This subset of patients had an average daily BG of 164 mg/dL (standard deviation of 45.6 mg/dL). The average number of hyper and hypoglycemic episodes per day were 1 and 0.046 respectively. Data collection and analysis for Phase 3 is ongoing.

Conclusions:
Final results and conclusions to be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Recognize appropriate basal and bolus dosing regimens for type 1 and 2 diabetic patients.
Identify appropriate parameters for blood glucose control in diabetic non ICU patients.

Self Assessment Questions:
According to the ACE, non-ICU diabetic patients should have a blood glucose level between:

A: 80-130
B: 90-140
C: 100-160
D: 110-180

According to the ACE and ADA, which is the most preferred option for bolus (meal time)insulin:

A: Insulin R
B: Insulin NPH
C: Insulin aspart
D: Pre-mixed Insulin: NPH/R (e.g. 70/30)

Q1 Answer: D    Q2 Answer: C
EVALUATION OF PHARMACIST ORDER PROCESSING TIME AT A COMMUNITY HOSPITAL BEFORE AND AFTER COMPUTERIZED PROVIDER ORDER ENTRY IMPLEMENTATION

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Purpose: Aurora Health Care is a 15-hospital system in eastern Wisconsin. Aurora is in the process of implementing an electronic health record throughout its hospitals and clinics. As part of that, Aurora is converting from pharmacist order entry to computerized provider order entry (CPOE). This change will likely affect not only how much time the pharmacist spends on order processing, but also how much time the pharmacist spends on other services throughout the day. The goal of this study is to objectively measure the impact of this order processing change on the amount of time the pharmacist spends on various activities.

Methods: Measurement of the amount of time the pharmacist is involved in various activities was accomplished using self-reported data gathered from a pager study. Pharmacists were alerted 6.4 times every hour to document their activity using a standardized form. This study was conducted for a duration of one week both six months before and six months after conversion to CPOE.

Order processing time was specifically measured both pre- and post-CPOE implementation. Pre-CPOE order entry by pharmacists was measured by tracking times in the computer as a variety of medication orders were entered. These orders included single medications, full order sets, and a full admission. The same orders were then presented to the pharmacists for verification after being entered using CPOE. To best control for variability, the pharmacists, computer station, patient profile, and time of day was held consistent in both phases of the study.

Results/Conclusions: Data collection and analysis is currently being done and will be presented at the Great Lakes Conference.

Learning Objectives:
Discuss which variables contribute to the overall order processing time.

Review the pharmacist activities have changed after the conversion to CPOE.

Self Assessment Questions:
1. According to this study, which of the following categories of orders takes longer to process using CPOE than with pharmacist order entry?
   A: Order sets containing many drugs
   B: Single injectable medication orders
   C: Full admission orders
   D: Single oral medication orders

2. First shift pharmacists documented which activity as having changed the most post-CPOE with respect to percentage of time spent?
   A: Order processing time
   B: Clinical activities
   C: Dispensing and distribution
   D: Administrative activities

Q1 Answer: A Q2 Answer: B

ACPE Universal Activity Number 121-999-11-373 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5

CHARACTERIZATION OF FEBRILE NEUTROPENIA IN RELATION TO MYELOID GROWTH FACTOR UTILIZATION IN PATIENTS RECEIVING CHEMOTHERAPY REGIMENS WITH AN INTERMEDIATE RISK FOR FEBRILE NEUTROPENIA

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Purpose: Chemotherapy-induced neutropenia is a major dose-limiting toxicity of systemic chemotherapy. The most common reasons for chemotherapy dose reductions and delays in treatment are complications resulting from neutropenic events. The prophylactic use of myeloid growth factors (MGF) can decrease the severity and length of neutropenia and reduce the incidence of febrile neutropenia (FN) by almost 50%. Prophylactic use of MGF is recommended for patients receiving chemotherapy regimens with an intermediate (10-20%) risk of FN in the presence of one or more patient-specific risk factors, which include patient age greater than 65 years, poor performance status, previous episodes of FN, extensive prior treatment including large radiation ports, administration of combined chemoradiotherapy, cytopenias due to tumor bone marrow involvement, poor nutritional status, the presence of open wounds or active infections, and more advanced cancer. The primary endpoint is to describe the incidence of FN in patients who received primary prophylaxis and in those who did not prior to receiving an intermediate risk chemotherapy regimen, and the secondary endpoint is to identify the risk factors for the development of FN which were present in patients who experienced a neutropenic event and in those who did not.

Methods: Retrospective data will be collected in patients diagnosed with Non-Hodgkins lymphoma, small cell and non-small cell lung cancer, and prostate cancer, who received an intermediate risk chemotherapy regimen. Patients will be screened for baseline risk factors known to increase the risk for the development of FN. The electronic medical records of all patients will be reviewed for episodes of FN, and the incidence of these events will be compared between the treatment and non-treatment groups.

Results/conclusions: Results and conclusions are pending and will be presented at a later date.

Learning Objectives:
Define chemotherapy categories of risk for developing febrile neutropenia following administration of different regimens of therapy.
Identify characteristics which increase a patients risk for developing febrile neutropenia following administration of chemotherapy.

Self Assessment Questions:
1) Prophylactic myeloid growth factors should be administered regardless: of individual risk factors for patients receiving chemotherapy regimens possessing how much risk for the development of febrile neutropenia?
   A: >10%
   B: >20%
   C: >30%
   D: >50%

2) According to studies, for a patient who is receiving a chemotherapy regimen which possesses an intermediate risk for the development of febrile neutropenia, the presence of how many risk factors in
   A: One
   B: Two
   C: Five
   D: This information has not been determined.

Q1 Answer: B Q2 Answer: D

ACPE Universal Activity Number 121-999-11-070 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
EFFECT OF ADDING RANOLAZINE TO AMIODARONE OR DRONEDARONE ON QT INTERVALS AND DISPERSION OF REPOLARIZATION TIMES IN PATIENTS WITH ADVANCED LEFT VENTRICULAR DYSFUNCTION

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Agents which prolong the QT interval are believed to increase the possibility of developing Torsade de Pointes by increasing the dispersion of repolarization times. However the pro-arrhythmic risk of the anti-arrhythmic agents varies considerably. Amiodarone and dronedarone have a very low potential to induce Torsade de Pointes despite increasing the QT interval, they do not increase the dispersion of repolarization times. Ranolazine is an antianginal agent which has a minor effect on prolonging the QT interval. Numerous studies have demonstrated the absence of any arrhythmic concerns. The increase in QT prolongation is not associated with an increase in dispersion of repolarization but an actual decrease in dispersion of repolarization. The purpose of this study is to investigate the effect of adding ranolazine to amiodarone or dronedarone on the QT interval and dispersion of repolarization times in patients with significant structural heart disease.

This randomized, double blind, cross over study will be submitted to the Institutional Review Board for approval prior to initiation. Participants who provide informed consent will be enrolled if they have significant ventricular dysfunction, an automatic implantable cardioverter defibrillator and are currently receiving either amiodarone or dronedarone. Participants will be excluded if they have a marked prolonged QTc interval or are currently taking other drugs associated with QT prolongation. Each subject will receive a baseline ECG and then be randomized to either ranolazine 500 mg twice daily or placebo. Seven days later an ECG and ranolazine blood level will be obtained. The dose of ranolazine will be increased to 1000 mg twice daily after a five day wash out period, the subjects will be crossed over to the opposite arm and the process repeated. The QT interval will be calculated and compared to placebo and baseline.

Learning Objectives:
Discuss the pathophysiology in the development of Torsade de Pointes.
Review the mechanism of action of ranolazine.

Self Assessment Questions:

What antiarrhythmic property contributes to the increasing risk of developing arrhythmias?
A Decreases in the QT interval.
B Decreased dispersion of repolarization times.
C Increased dispersion of repolarization times.
D QRS prolongation.

What is the mechanism of action of ranolazine?
A Activation of the late sodium current and decreasing the dispersion of repolarization times.
B Inhibition of the late sodium current and decreasing the dispersion of repolarization times.
C Activation of the late potassium current and decreasing the dispersion of repolarization times.
D Inhibition of the late potassium current and increasing the dispersion of repolarization times.

Q1 Answer: C Q2 Answer: B

PATIENTS PERCEPTIONS OF A PHARMACY-BASED NUTRITION SERVICE IN A GROCERY STORE SETTING

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Background:
One-third of the American population is obese as the prevalence of obesity continues to rise. The risk of serious medical conditions can be decreased by maintaining a healthy diet and lifestyle. Community pharmacists can help this public health challenge by providing lifestyle modification educational services.

Purpose:
The primary objective of this study is to assess patients perceptions of a community pharmacy-based nutrition service in a grocery store setting. Secondary objectives include assessing nutrition knowledge gained and satisfaction from participation in a nutritional food tour program.

Methods:
This pilot program is a survey based study which includes the implementation of a nutritional food tour service and anonymous pre- and post-surveys to assess patients perceptions, knowledge, and satisfaction with the program. A convenience sample of pharmacy patrons ≥18 years old interested in participating in this study will be used. The nutritional food tour service will educate participants on pertinent topics in nutrition while guiding them through the various aisles of the grocery store to practice hands-on healthier food choices selection. Pre-survey items collect demographic information, perceptions of a community pharmacy based nutrition service, and baseline nutrition knowledge. Post-survey items assess changes in perceptions, nutrition knowledge gained, and satisfaction with the service.

Preliminary Results:
Data collection is under progress. Results will be presented at the Great Lakes Pharmacy Resident Conference.

Conclusions:
Pharmacists, particularly those who practice in the grocery store setting, can act as change agents by providing a pharmacy-based nutrition service. This service will potentially help patients change their eating behaviors through education and empower them to improve their own health outcomes.

Learning Objectives:
Identify the number of Americans that are currently obese as the prevalence of obesity continues to be on the rise.
Describe a method of delivering a pharmacy-based nutrition service in a grocery store community pharmacy setting.

Self Assessment Questions:
Which of the following statements is correct?
A Currently one-fourth of the American population is obese
B Currently, half of the American population is obese
C Currently, one-third of the American population is obese
D Currently, three-fourths of the American population is obese

Patients that participated in this study preferred to participate in a pharmacy-based nutritional service through:
A One-on-one consultation with pharmacist
B Participation in a nutritional food tour program
C Reading newsletters written by the pharmacist
D Receiving nutrition tips via email from the pharmacist

Q1 Answer: C Q2 Answer: B

ACPE Universal Activity Number 121-999-11-443 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5
THE EFFICACY OF AMINOPENICILLIN ANTIBIOTICS FOR THE TREATMENT OF VANCOMYCIN SUSCEPTIBLE AND VANCOMYCIN RESISTANT ENTEROCOCCAL URINARY TRACT INFECTIONS
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At the University of Illinois Medical Center (UIMC), aminopenicillins are the standard of care for patients without a documented penicillin allergy diagnosed with an enterococcal urinary tract infection. The objective of this study is to examine treatment failures in aminopenicillin treated patients and patients given alternative antibiotics for enterococcal urinary tract infections. The UIMC microbiology laboratories patient database will be used to identify patients who, over a four year period, from January 1, 2008 to September 30, 2010, were found to have a positive enterococcal infection from a urinary culture. Patients aged 18 years or younger and patients with concomitant infections for which they are receiving an antibiotic with enterococcal coverage will be excluded. Patients with a positive urinary culture for vancomycin susceptible or vancomycin resistant enterococcus will be included if they received antibiotic treatment for the urinary tract infection. The following data will be collected: age, sex, height, weight, body mass index, hospital length of stay, renal function, liver function, data confirming confirmation of infection including urinalysis and urine culture, antibiotic used, duration of treatment, and risk factors for failure. All data will be recorded without patient identifiers and maintained confidentially. The primary investigator will examine treatment failure between aminopenicillins and alternative antibiotics. A subgroup analysis will examine the treatment failure of aminopenicillins according to each enterococcal to establish aminopenicillin efficacy by species.

Learning Objectives:
Discuss the role of aminopenicillins for vancomycin resistant and vancomycin susceptible enterococcal urinary tract infections.
Describe the antimicrobial resistance mechanisms developed by different enterococcal species.

Self Assessment Questions:
Different enterococcal resistance mechanisms include all of the following except:
A: Beta-lactamase production in E. faecalis
B: Alterations in penicillin binding proteins in E. faecalis
C: Alterations in penicillin binding proteins in E. faecium
D: Efflux pumps

All of the following antibiotics have potential efficacy against vancomycin susceptible Enterococcus spp. except for:
A: Daptomycin
B: Vancomycin
C: Cefepime
D: Ampicillin

Q1 Answer: D Q2 Answer: C

ACPE Universal Activity Number 121-999-11-220 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

DEVELOPMENT OF A PHARMACIST-MANAGED DIABETES CARE SERVICE IN AN OUTPATIENT INDIGENT RESIDENT CLINIC
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Background:
The American Diabetes Association (ADA) recommends tight glucose control to decrease and prevent microvascular and macrovascular complications. St. Joseph Mercy Oakland Hospital has an outpatient internal medicine resident clinic that serves the indigent population and grants patients access to affordable medical care and prescription medications. Many patients seen at the clinic have diabetes and may not be achieving optimal glucose control. There is also increasing evidence to support collaborative practice models between pharmacists and physicians in the management of diabetes. The purpose of this study is to assess current diabetes care provided by the physicians and to determine how pharmacists can help improve patient care for diabetic patients seen at the medical clinic. This data will be used to design a pharmacist-managed diabetes care service to augment care provided by the physicians in the clinic.

Methods:
This was a retrospective chart review of patients with diabetes treated at the outpatient clinic. Potential participants included men and women, 18 years of age or older that were identified as having diabetes using ICD-9 codes 250.0, 250.1, 250.2 and 250.3. Pregnant women were excluded. Physician adherence to the 2010 ADA Standards of Care for Diabetes was assessed to determine whether patients were reaching target glycosylated hemoglobin (HbA1C), fasting blood glucose (FBG) levels, blood pressure values and lipid profiles and whether they were being monitored appropriately. Monitoring of urine micro albumin and serum creatinine, as well as appropriate use of angiotensin-converting enzyme (ACE) inhibitors or angiotensin II receptor blockers (ARBs) and anti-platelet therapy was also assessed. Lastly, performing annual retinal and foot exams and the administration of pneumococcal and influenza vaccinations was evaluated.

Results:
Data collection and protocol development is currently ongoing. Completed results and development of the pharmacist managed diabetes care service will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Identify how pharmacists can contribute to improving overall outcome in diabetic patients.
Describe the methods for designing a pharmacist-managed diabetes care service.

Self Assessment Questions:
Pharmacist-managed diabetes services have been shown to:
A: Improve glycosylated hemoglobin (HbA1C)
B: Improve patient medication adherence
C: Enhance compliance with the ADA standards of care
D: All of the above

Collaborative drug therapy management enables pharmacists to initiate or modify drug therapy in accordance with written guidelines or protocols under the designation of who?
A: American College of Clinical Pharmacy (ACCP)
B: Physicians
C: Board of Pharmacy
D: FDA

Q1 Answer: D Q2 Answer: B

ACPE Universal Activity Number 121-999-11-326 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
EVALUATING THE PROTECTION AGAINST HOSPITAL GI BLEED WITH ACID SUPPRESSIVE THERAPY IN NON-CRITICALLY ILL PATIENTS WITH COAGULOPATHY

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Background: Gastrointestinal (GI) bleeding in hospitalized patients secondary to stress related mucosal disease results in significant morbidity and mortality. Nosocomial GI bleeding has been extensively studied in the intensive care setting; however studies are lacking in the non-critically ill population. Various mechanisms have been shown to cause GI bleeding in stress related mucosal disease, but insult is primarily due to increases in gastric acid secretion. Acid suppressive therapy (AST) in the critically ill patient population has demonstrated benefit in multiple studies; however routine use of AST outside this population has not shown clinical benefit because of this populations low risk of bleeding. Current guidelines published by the American Society of Health-System Pharmacists outline appropriate stress ulcer prophylaxis in certain populations according to underlying risk factors, without mention of an indication of use for the non-critically ill population. Various reviews suggest that AST may be overused among non-critically ill patients without risk factors for GI bleed.

Purpose: The purpose of this study is to evaluate if the use of acid suppressive therapy in hospitalized, non-critically ill patients with coagulopathy is protective against hospital gastrointestinal bleed.

Methods: This study is a retrospective chart review of non-critically ill patients with identified coagulopathy (platelets <50,000, INR >1.5, or PTT > 2.0 x control value) hospitalized at Edward Hines Jr., VA Hospital from 2/10/2010 to 10/10/2010. In the identified population, the rate of gastrointestinal bleeding in patients receiving AST will be compared to that of those individuals not receiving AST. Secondary outcomes to be assessed include: rate of infection (pneumonia or C. difficile infection), concurrent medication use with increased bleeding risk (NSAIDs, corticosteroids, clopidogrel, heparin, warfarin or aspirin), type and dose of AST and organ impairment.

Results: Research in progress. Results to be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Identify the complications associated with prolonged use of acid suppressive therapy.
Indicate the appropriate use of AST in hospitalized patients.

Self Assessment Questions:
Identify a potential risk of prolonged acid suppressive therapy?
A Hyperchloremia
B Increased infection rate
C Decreased BP
D Prolonged hospital stay

Which of the following is not an appropriate indication for AST as outlined in the ASHP guidelines:
A A patient in the ICU under mechanical ventilation for >48 hours
B A spinal cord injury patient with recent onset septic shock
C A patient with CrCl of 45 mL/min that has just received hepatic transplant
D A patient with coagulopathy (platelet <50,000) receiving antibiotic

Q1 Answer: B Q2 Answer: D

EVALUATION OF BARCODE MEDICATION ADMINISTRATION SYSTEMS IN NON-INPATIENT CARE AREAS OF AN ACADEMIC MEDICAL CENTER

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Purpose:
To evaluate the utility of barcode medication administration systems in non-inpatient care areas by assessing impact on medication administration accuracy, documentation, and user satisfaction.

Methods:
The University of Wisconsin Hospital currently uses handheld barcode scanners for barcode medication administration (BCMA) in all inpatient areas in conjunction with an electronic medical record (EMR). This project will implement BCMA technology in non-inpatient areas that are already using the EMR such as the emergency department and the dialysis center.

To assess the baseline medication administration error rate, naive observers will collect data on the administration of medications which will then be compared to the physicians orders to identify medication administration errors. The current medication administration workflow will be documented and then, using a human factors engineering approach, redesigned by an interdisciplinary group to incorporate BCMA technology. After implementation of the BCMA technology and new workflow, naive observers will again collect data on medication administration errors. Utilization of the technology will be assessed by comparing dispenses from an automated dispensing cabinet to documentation in the medical record. In addition, a satisfaction survey will be distributed to all users in the areas of study before and after BCMA implementation to assess their satisfaction with the medication administration workflow.

Results:
This project aims to demonstrate the increase in medication administration accuracy and documentation associated with BCMA technology.

Conclusions:
Significant obstacles to changing practice require a team approach to seek resolution.

Learning Objectives:
Identify obstacles to implementing BCMA technology in a new patient care area.
Describe practical approaches to gaining acceptance a new technology and workflow.

Self Assessment Questions:
Which of the following was an obstacle to BMCA implementation encountered in the ED?
A BCMA devices were difficult for staff to understand
B Medications were administered before the order was placed in the BCMA devices were not fast enough for emergency situations
D There was a lack of computer stations on which to enter medicat

Which of the following is a good strategy for influencing people's behavior?
A Have an authority figure tell them what to do
B Discipline those who do not adapt quickly
C Offer monetary incentives to encourage change
D Give people a participatory role in determining the new practice

Q1 Answer: B Q2 Answer: D

ACPE Universal Activity Number 121-999-11-119 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
Activity Type: Knowledge-based     Contact Hours: 0.5

What is/are related adverse outcome(s) of high dose ESA in patients on hemodialysis patients?

What is a postulate role of ergocalciferol supplementation in reducing erythropoiesis stimulating agents (ESA) and one study also reported maintaining hemoglobin (Hgb) levels which suggested an epoetin-sparking effect.

The objective of this retrospective, observational study was to examine the Hgb and doses of darbepoeitin (DARB) in HD patients replenished with ergocalciferol.

Patients with 25(OH)D serum levels < 30 ng/mL at the baseline were included in the study. The ergocalciferol dosing guideline recommended by the National Kidney Foundation Kidney Disease Outcomes Quality Initiative (KDOQI) were implemented. Laboratory parameters and DARB doses were collected for 12 months.

A total of 98 patients had a mean age of 57 years old with male (53%) and African-Americans (67%). Sixty percent were compliant on ergocalciferol. The serum 25(OH)D levels increased significantly in the compliant group compared with non- or partially-compliant group (28.83 vs 20.89 ng/mL, p = 0.002). There were 36.51% in the compliant group who achieved a 25(OH)D level > 30 ng/mL and 17.14% in non- or partially-compliant group (p = 0.004). There was no significant difference in Hgb levels between groups (11.68 vs. 11.87 g/dL p = 0.473). The DARB doses were significant decreased from baseline found only in the compliant group (-0.02 mcg/kg/week/g per 100 mL, p = 0.024).

The ergocalciferol replenishment resulted in improved serum 25(OH) D levels, maintained Hgb, and decreased the DARB doses which confirmed with the previous studies. Further studies are needed to expand the study size and other clinical outcomes of ergocalciferol in HD patients.

Learning Objectives:
- Review roles of inactive vitamin D supplementation in hemodialysis patients.
- Recognize outcomes of dose reduction of erythropoiesis stimulating agents.

Self Assessment Questions:
What is a postulate role of ergocalciferol supplementation in hemodialysis patients?
- A anti-proliferative activity with erythropoietin on erythroid burst-forming units in bone marrow
- B: direct increasing calcium absorption
- C: direct proliferative activity with erythropoietin on erythroid burst-forming units
- D: indirect decreasing serum parathyroid hormone

What is/are related adverse outcome(s) of high dose ESA in patients with CKD on HD?
- A increased mortality
- B increased risk of bleeding
- C increased thromboembolic events
- D Both A and B are correct

Q1 Answer: C Q2 Answer: D

THE EFFECT OF DIABETES MEDICATION REGIMEN INTENSIFICATION AFTER HOSPITALIZATION

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Purpose
The primary purpose of this study is to evaluate whether intensifying patients outpatient diabetes regimens after admission to a non-ICU service at the hospital with a hemoglobin A1C >7% results in improved glycemic control at follow-up. Follow-up can consist of an outpatient clinic visit or repeat hospitalization. A1C is the primary endpoint, and secondary outcomes will compare the incidences of hospitalization and hypoglycemia in patients whose therapy was intensified and in those whose was not. The Society of Hospital Medicine (SHM) advocates for the intensification of a patients outpatient regimen if he is admitted with a hemoglobin A1C >7%. In addition, the American College of Endocrinology and the American Diabetes Association identify the postdischarge time frame as an area needing further research.

Methods
A report will be run to generate a list of patients admitted with diabetes and an A1C >7%. It is anticipated that 1000 patients will be screened in order to enroll 324 patients in the study to detect a 0.5% difference in A1C with 80% power. Charts will be reviewed for the following baseline patient characteristics: age, gender, race, admission diagnosis, A1C, and diabetes medication history. Diabetes regimens at discharge will be recorded as well. In addition, the following data will be collected regarding their diabetes care at follow-up: A1C, current diabetes medications, medication adherence, and hypoglycemic events. The characteristics of the study sample will be described using means and standard deviations for continuous variables and counts and percentages for categorical variables. Differences in the magnitude of A1C change will be compared via a t test. Non-adherence will be assessed to make sure groups are similar. Incidences of hospitalization and hypoglycemia will be analyzed by the Chi Square or Fishers exact test.

Results and Conclusions
Data collection is currently in progress.

Learning Objectives:
- List reasons for suboptimal diabetes treatment in the non-ICU acute care setting.
- List SHM recommendations for intensification of diabetes regimens based on A1C.

Self Assessment Questions:
Which of the following has the literature identified as a contributing factor to the inadequate treatment of diabetes in the inpatient setting?
- A Inability to test blood glucose frequently
- B: Diabetes not being the chief complaint
- C: Price of antidiabetic agents
- D: Fear of hyperglycemia

Which of the following does SHM recommend as an action to take when intensifying diabetes therapy at discharge for a patient admitted with an A1C 7-8%?
- A Add basal insulin
- B Add meal-time insulin
- C Add an alpha-glucosidase inhibitor
- D Add a dipeptidyl peptidase IV inhibitor

Q1 Answer: B Q2 Answer: A

ACPE Universal Activity Number 121-999-11-073 -L01-P
Activity Type: Knowledge-based     Contact Hours: 0.5
ASSISTING TYPE II DIABETIC PATIENTS IN A HEART FAILURE CENTER MEET THERAPEUTIC GOALS THROUGH MEDICATION THERAPY MANAGEMENT SERVICES AND STANDARDIZED COMMUNICATION WITH PRIMARY CARE PROVIDERS

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Purpose:
To define the role of the clinical pharmacist in helping patients with type II diabetes mellitus seen in the heart failure center to meet their therapeutic goals and to pilot a methodical approach of communication with primary care providers. The secondary objective is to categorize the number, type, and severity of drug therapy opportunities identified.

Methods:
This is a prospective, pilot study in which up to 30 participants will be enrolled in the study. Inclusion criteria are: 1) patients of the Marshfield Clinic Heart Failure Center, 2) diagnosis of Type II diabetes mellitus, 3) 18 years of age or older, and 4) 6 or more medications on profile. Exclusion criteria are: 1) patients who have a non-Marshfield Clinic primary care provider and 2) have had a pharmacist-patient MTM encounter in the last 6 months. The MTM session will be performed by the PGY1 pharmacy resident, according to the American Pharmacists Association consensus definition of the MTM service model and the Pharmaceutical Care framework. The MTM session will include medication reconciliation, identification and evaluation of drug therapy problems, patient education, and the development of a patient specific care plan. Once the MTM visit has been completed and recommendations have been finalized, the results of the visit, along with the care plan will be reviewed with the pharmacist mentor and primary care provider and documented. A pathway for communication with the primary care provider will be developed in coordination with a quality improvement team. Descriptive statistics will be utilized to evaluate the frequency and type of drug therapy problems present, along with the recommendation acceptance rate. Drug therapy opportunities will be assigned a rating based on the severity level and analyzed for clinical significance.

Results/Conclusions:
Data collection and analysis will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Describe the role of the clinical pharmacist in Medication Therapy Management and the impact the pharmacist can have on a patient specific drug therapy and education.
Discuss the type and severity of drug therapy opportunities commonly identified in diabetic patients with heart failure.

Self Assessment Questions:
Which of the following would be considered providing Medication Management Therapy services?
A Counseling a patient when he/she is picking up his/her prescription
B: Assessment and evaluation of patient's complete medication therapy
C: Chart review at a skilled nursing facility
D: Medication reconciliation upon admittance to the hospital

A patient with diabetes is using insulin glargine 24 units at bedtime and insulin aspart 8 units three times daily before meals. The patients HbA1c from today was 8.6%. She reports she has not miss
A Nonadherence
B Adverse drug event
C: Unnecessary medication therapy
D: Dosage too low

Q1 Answer: B Q2 Answer: D

EVALUATION OF CEPHALOSPORIN USE IN THE TREATMENT OF URINARY TRACT INFECTIONS

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Purpose: Urinary tract infections (UTI) are estimated to be responsible for as many as 8,000,000 office visits and 100,000 hospitalizations per year. Current guidelines recommend ciprofloxacin or trimethoprim/sulfamethoxazole for the treatment of UTIs, and do not include beta-lactam agents as first line therapy. Recent studies have indicated that beta-lactam antibiotics can effectively treat urinary tract infections, a conclusion not reached by the previous guidelines. The antimicrobial susceptibilities at our institution support the use of cephalexin, cefalexin or cefaclor for the treatment of urinary tract infections and high usage for this indication has been noted. The objective of this study is to assess for the non-inferiority of cephalexin compared with ciprofloxacin or trimethoprim/sulfamethoxazole in the treatment of urinary tract infections.

Methods: This study is a retrospective cohort of 200 patients treated for a UTI between August 1, 2010 and October 31, 2010. Patients included are those between 18 and 85 years of age and treated with one of the study agents (ciprofloxacin, trimethoprim/sulfamethoxazole, or cephalexin) for a gram-negative urinary tract infection. The primary outcome is the 30-day readmission or retreatment rate for urinary tract infections. Other Data collected will include patient baseline characteristics, comiconitants infections (pneumonia and bacteremia), antimicrobial susceptibilities, and antinicrobial therapy.

Results/Conclusion: The results and conclusion of the study are pending.

Learning Objectives:
Describe the current susceptibility profile of gram-negative organisms found in urinary cultures at Henry Ford Health Systems and assess the appropriateness of the study drugs as initial therapy.
Discuss the appropriateness of each of the study drugs in the treatment of urinary tract infections based on the 30-day retreatment or readmission rate for urinary tract infection. 

Self Assessment Questions:
Which of the following is considered a first-line therapy for the treatment of urinary tract infections ?
A: Amoxicillin
B: Trimethoprim/Sulfamethoxazole
C: Nitrofurantoin
D: Moxifloxacin

Which of the following is true?
A: There are a significant number of studies used in the IDSA cystitis guidelines
B: The IDSA cystitis guidelines recommend trimethoprim/sulfamethoxazole
C: Recent randomized controlled trials have shown that beta-lactam agents are effective for UTIs
D: Influential resources such as Mandell’s Principles and Practices of Infectious Diseases

Q1 Answer: B Q2 Answer: C

ACPE Universal Activity Number 121-999-11-215 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
CLINICAL OUTCOMES OF QTc PROLONGATION AND HIGH RISK TORSADES CLINICAL SUPPORT ALERTS
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Purpose:
The purpose of this study was to evaluate the clinical outcomes of patients for which medication orders caused the QTc Prolongation or High Risk of Torsades alert to fire.

Methods:
This was a retrospective study evaluating patients from Indiana University Health Methodist Hospital. To be included in the study, patients had to be at least eighteen years of age and had either the QTc Prolongation or the High Risk of Torsades alert fire. The exclusion criteria were any patient less than eighteen years old, outpatients, and those patients who were deceased prior to entering the medication order. The primary objective was to assess if implementation of the alerts changed prescribing practices by evaluating abandonment of the order and/or subsequent dose reduction. A secondary objective evaluated the incidence of ventricular tachycardia and/or death for those patients who had the order triggering the alert entered versus those whose order was abandoned at the time of order entry. Other data collected included: demographic data, medication triggering the alert, use of calcium or magnesium replacement within 48 hours of the order being entered, and QTc trends following the alert firing.

Results and Conclusions:
Data collection is currently in progress and will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
List four of the risk factors for QTc prolongation assessed in the custom discern alert.
Describe the potential benefits of implementing prospective clinical decision support.

Self Assessment Questions:
Torsade de pointes is a type of
A: Atrial fibrillation
B: Pulseless electrical activity
C: Ventricular tachycardia
D: Ventricular fibrillation

Serum potassium less than ____ mEq/L was considered a risk factor for the QTc prolongation alert?
A: 4.5
B: 4
C: 3.8
D: 3.5

Q1 Answer: C    Q2 Answer: D

ACPE Universal Activity Number 121-999-11-470-L05-P
Activity Type: Knowledge-based    Contact Hours: 0.5

ASSESSMENT OF PATIENT OUTCOMES DURING THE INTRODUCTION OF PHARMACY ON A RAPID RESPONSE TEAM
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Purpose:
The purpose of this study is to evaluate the impact of pharmacist’s interventions on patient outcomes during rapid response team consultations.

Background:
The purpose of a rapid response team is to bring a critical-care trained staff to a patient that meets pre-determined criteria of potential deterioration within a general practice unit. Literature published by the Institute for Healthcare Improvement (IHI) has suggested a decrease of in-hospital mortality and cardiopulmonary arrest rates when a rapid response team has been instituted. Typically, most rapid response teams are staffed by critical-care trained nurses. Although, pharmacists possess a unique skill set focused on the identification and resolution of drug related problems, which is often a precipitating cause of a rapid response team consultation. Currently, there is no data to support the incorporation of a pharmacist on the rapid response team.

Methods:
This is a prospective, quasi-experimental study that has been approved by the Institutional Review Board. All patients greater than 18 years old that required a rapid response team consultation from 7 A.M. until 3:30 P.M. were included. Rapid response team follow ups and intensive care unit (ICU) patients were excluded. 7 ICU pharmacists were trained on a systematic approach to responding to consults. Pharmacists respond at weekly intervals. Data collection includes specific pharmacists interventions, baseline demographics, presenting serum chemistries, vital signs, and comorbidities. The primary outcome is a composite of incidence of in-hospital cardiopulmonary arrest and incidence of ICU admission 6 and 24 hours after a rapid response team consult. The secondary outcomes include pharmacist interventions, in-hospital mortality rate, and average hospital and ICU length of stay.

Results:
Results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Define the role of rapid response teams in healthcare institutions.
Identify the role of pharmacists during rapid response team consultation:

Self Assessment Questions:
According to research completed by the Institute for Healthcare Improvement (IHI) on rapid response teams, which of the following was shown to be true?
A: Decreased in-hospital length of stay
B: Decreased cardiac arrests in general practice units by 67%
C: Immediate decreases of in-hospital mortality by 70%
D: Decreased intensive care unit transfer rates

2. Pharmacists are initially most likely to be involved in which of the following areas during a rapid response team consultation?
A: Assessment of early warning signs of a code blue and stabilization
B: Communication with higher levels of care (intensive care unit) about
C: Transfer of a patient to an intensive care unit
D: Education of current and future medical team about the status of the

Q1 Answer: B    Q2 Answer: A

ACPE Universal Activity Number 121-999-11-422-L04-P
Activity Type: Knowledge-based    Contact Hours: 0.5
Efficacy and Safety of Aminolevulinic Acid for Actinic Keratosis in a Veteran Population

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Background:
Actinic keratoses (AKs) are cutaneous neoplasms that develop as a result of chronic sun exposure and are widely considered to be premalignant lesions. Although many modalities of treatment are available, strong clinical data on the outcomes and comparison of these therapies is limited. Aminolevulinic acid plus photodynamic therapy (ALA-PDT) is one treatment option that involves the application of topical ALA followed by treatment with a non-laser blue light source 14 to 18 hours later. ALA is indicated for the treatment of minimally to moderately thick AKs of the face or scalp. Transient local symptoms are anticipated as a part of the PDT response. At Jesse Brown VA Medical Center (JBVAMC), ALA-PDT use has been extended to include application to areas other than the face and scalp, and a shorter incubation period is frequently used.

Purpose:
To evaluate the safety and efficacy of ALA for the treatment of actinic keratosis.

Methods:
This is a retrospective, electronic chart review of JBVAMC patients ≥ 18 years of age with a prescription for ALA at any time between January 1, 2008 and September 15, 2010. Patients who receive ALA for a non-AK indication are excluded. The primary endpoints are the percentage of patients showing AK lesion improvement or complete clearance after each ALA-PDT treatment and the percentage of AK lesions cleared after each ALA-PDT treatment, categorized by location. Secondary endpoints include: incidence of adverse effects associated with treatment, follow up appointment compliance, assessment of whether patients are receiving sun protection counseling and/or a prescription for sunscreen, and determination of the fixed costs associated with treatment and comparison to other AK treatment options.

Results/Conclusions:
Data collection and analysis are ongoing. Results with conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
- Explain the etiology and pathogenesis of AKs.
- Recognize the appropriate use of ALA as a viable treatment option in the management of AKs and explain current clinical practice trends.

Self Assessment Questions:
Which of the following is true regarding AK lesions?
A. They have the potential to become squamous cell carcinoma
B. They develop as a result of chronic skin exposure to sunscreen
C. Prevalence is higher in darker skinned individuals
D. They are most frequently found on the back and legs

Which of the following is an FDA approved indication for ALA in the treatment of AKs?
A. Lesions on the face
B. Lesions on the back
C. Lesions on the scalp
D. Both A and C

Q1 Answer: A  Q2 Answer: D

Activity Type: Knowledge-based  Contact Hours: 0.5

Clinical Implications of MIC Interpretive Standards for Beta-lactam Susceptibility in Gram-negative Bacteremia

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Purpose:
Susceptibility breakpoints for minimum inhibitory concentrations (MICs) of pathogenic organisms are used to interpret activity of antimicrobial agents. Two of the major organizations which determine breakpoints (the European Committee of Antimicrobial Susceptibility Testing, EUCAST, and the Clinical and Laboratory Standards Institutes, CLSI) differ in their recommendations for certain beta-lactam antimicrobials. The purpose of this study was to evaluate the impact of differing interpretive standards on clinical and microbiological outcomes in the treatment of Gram negative bacteremia.

Methods:
A retrospective cohort of 225 patients with bacteremias caused by Enterobacteriaceae and non-fermenting Gram-negative organisms who were treated with a cephalosporin, anti-pseudomonal carbapenem or monobactam was conducted. Demographic and comorbidity information was collected, as were data about both the infections and treatment courses. Infection-specific information included location of admission at time of positive blood cultures, other sites of organism growth, and susceptibility information. Treatment-specific information included antibiotic selected, duration of therapy and appropriateness per MIC breakpoint interpretation. Patient cases were evaluated for clinical outcome by two blinded reviewers using the following markers: fever, leukocytosis, hypotension, blood cultures, pathogen eradication and 30-day follow-up status. Pending completion of data collection, primary analysis of relative risk of treatment failure will be calculated by comparing outcomes in patients treated with an antibiotic to which the pathogen was susceptible per EUCAST (controls, n = 150) to those treated with an antibiotic to which the pathogen was non-susceptible per EUCAST (cases, n = 75). Regression analysis will be conducted to identify variables associated with treatment failure, and subgroup analyses will be performed on those patients with no changes made to their initial antibiotic regimens, and those who received monotherapy. The impact on differing breakpoints on the current institutional antibiogram will also be assessed.

Results:
To be presented upon project completion.

Learning Objectives:
- Identify factors associated with poor outcome in the treatment of Gram negative bloodstream infection.
- Describe differences and limitations of the available interpretive standards for antimicrobial susceptibility testing.

Self Assessment Questions:
Which of the following factors are associated with poor outcome in the treatment of Gram negative bloodstream infection?
A. APACHE II score > 15
B. Malignancy
C. Infection acquired while hospitalized
D. All of the above

Which of the following standards are expected to correlate with the lowest MIC breakpoints?
A. CLSI M-100 S19
B. CLSI M-100 S20
C. EUCAST
D. MIC breakpoints are the same

Q1 Answer: D  Q2 Answer: C

Activity Type: Knowledge-based  Contact Hours: 0.5
MICROBIAL COLONIZATION OF AUTOMATED DISPENSING CABINETS IN A COMMUNITY HOSPITAL
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Purpose: The purpose of this study was to determine whether automated dispensing cabinets (ADCs) at a community hospital are a potential reservoir for bacteria and to determine what effect an isopropyl alcohol cleaning regimen would have in reducing bacterial colonization of the ADC.

Methods: ADCs from a general medical/surgical intensive care unit, a general medical/surgical floor, and the emergency department were selected. Samples were collected from three areas on each ADC: a single quadrant of the touch-screen, commonly used keys on the keyboard, and the lids of the three most frequently used medication cabinets (as determined by a drug utilization review). Sampling occurred once weekly for two weeks to determine baseline microbial burden. Thereafter, an isopropyl alcohol cleaning regimen was instituted once daily for 1 week. Immediately after the last cleaning, cultures were drawn. Cultures were drawn again at 24 hours and 1 week post-cleaning, in order to evaluate the effectiveness of the cleaning regimen.

Results: Pre-cleaning culture results showed a spectrum of bacteria largely consistent with that of normal human skin flora. All ADC keyboards and touch-screens harbored coagulase-negative Staphylococcus. Every keyboard culture grew more than one organism, and every ADC sample site grew one or more organisms. Post-cleaning results show that isopropyl alcohol was effective in greatly reducing bacteriologic burden. These effects seemed to persist for less than 24 hours, beyond which time the cultures of each surface showed bacterial growth similar to baseline.

Conclusions: ADCs are a viable surface for bacterial survival. While implementation of a daily cleaning regimen may be logistically cumbersome, the ADC should be considered a potential source of bacterial contamination during an outbreak and disinfected accordingly.

Learning Objectives:
Describe the types of organisms that have been found on the surface of automated dispensing cabinets.
Recognize the impact of an isopropyl alcohol cleaning regimen on the microbial burden of an automated dispensing cabinet.

Self Assessment Questions:
Roughly how long did the effects of an isopropyl alcohol cleaning persist? (i.e., reduce bacterial burden)
A 24 hours
B 48 hours
C 72 hours
D 1 week

What organism was found on every keyboard and touch-screen that was cultured?
A Clostridium difficile
B Streptococcus sp.
C Coagulase-negative Staphylococcus
D Aspergillus

Q1 Answer: A Q2 Answer: C

ACPE Universal Activity Number 121-999-11-412 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5

USING COMMUNICATION AND TECHNOLOGY TO IMPLEMENT AN INTRAVENOUS TO ORAL THERAPY POLICY
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Purpose: Conversion of medications from the intravenous (IV) to oral form is performed to optimize patient therapy, reduce medication costs, and reduce the risks of line infections in hospitalized patients. Previous studies at the Ohio State University Medical Center, the intravenous to oral program required contacting the prescriber prior to making the conversion. With the new protocol, pharmacists are authorized to convert a patient from intravenous to oral therapy if the following criteria are met: ingesting an oral or tube feed diet, receiving one or more scheduled oral medications, and is on intravenous linezolid, moxifloxacin, and fluconazole. The pharmacist then modifies the order electronically and sends an electronic page to the physician to alert them of the change. This study was undertaken to assess the effectiveness of pharmacist education preceding and after the policy change.

Methods: Multiple methods were used to optimize pharmacist participation in the program, including written, verbal, and electronic education and communication. The protocol medications were added to the daily monitored medications report. A current list of patients receiving the targeted IV medications populates the front page of the pharmacy order entry system to both remind the pharmacists of their role in the process and to assist them in identifying patients eligible for conversion. Data collected includes the ratio of IV to oral drug use prior to pharmacist education and after, and a one-month concurrent assessment of pharmacist IV to oral interventions. The IV to oral ratio is used to measure changes in utilization while adjusting for changes in total medication volume over time.

Results/Conclusions: Data collection is underway and results and conclusions will be presented at the 2011 Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Describe the advantages of patients taking oral therapy versus intravenous therapy if appropriate.
Identify the impact of a change to the intravenous to oral conversion policy on the use of select medications by the intravenous and oral routes.

Self Assessment Questions:
Which of the following are reasons oral therapy can be beneficial over intravenous therapy?
A Improved tissue penetration and blood levels
B Lower cost and reduced risk of line infections
C Greater bioavailability and more rapid onset of action
D Extended half life and duration of action

Which of the following may be a reason to continue intravenous therapy?
A The patient is ordered to take nothing by mouth after having receive
B The patient is only on two oral medications, while ten others are in
C The medication is available in both an oral and intravenous form.
D The patient has a central line, so administration is easy and low risk

Q1 Answer: B Q2 Answer: A

ACPE Universal Activity Number 121-999-11-374 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5
IMPACT OF PHARMACIST FACILITATED DISCHARGE MEDICATION RECONCILIATION
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Purpose:
Preventable adverse drug events (ADEs) occur most frequently at transitions in care and are a major problem for many patients following hospital discharge. Poor medication reconciliation and communication at those transitions are responsible for many of those medication errors and resulting ADEs. Medication reconciliation is a crucial part of patient care and should be completed by taking an interdisciplinary approach.

There is pharmacist involvement in portions of medication reconciliation; however, pharmacist involvement in discharge medication reconciliation is lacking at many institutions, including Battle Creek Health System (BCHS). The purpose of this study is to assess the impact that direct pharmacist involvement in the discharge medication reconciliation process will have on medication discrepancies, patient outcomes, and satisfaction.

Methods:
A prospective chart review analysis was designed to assess the impact of pharmacist facilitated discharge medication reconciliation within the hospitalist service. For the control group, patients on at least one discharge medication that had traditional discharge were randomly selected and reviewed. For the intervention group, patients on at least one discharge medication that had pharmacist involvement in discharge were reviewed. The chart review was standardized between reviewers and was conducted in the facilities electronic medical records.

Discharge summaries were checked for possible discrepancies with medication therapy and categorized accordingly. Patients were further assessed 30 days after discharge for readmission or emergency department visits to BCHS. Patients and providers were also surveyed before and after the study on perception of the discharge process. The primary outcome measure was medication discrepancies present at discharge, with secondary measures of 30-day readmission, emergency department visits within 30 days of discharge, and satisfaction of patients and providers with the new practice.

Results and Conclusion:
Data collection and analysis is underway and will be presented at the Great Lakes Pharmacy Residency Conference.

LEARNING OBJECTIVES:
Recall the significant steps involved in medication reconciliation.
Recognize the type of medication discrepancies a clinical pharmacist identifies prior to discharge that may be missed without pharmacist involvement in discharge medication reconciliation.

Self Assessment Questions:
Which of the following is a significant step in medication reconciliation?

A: Using an old outdated medication list and comparing it to a list of
B: Evaluating the new medication list for possible discrepancies.
C: Communicating the new medication list to the appropriate provider
D: Providing multiple different medication lists to patients.

What are some of the most common medication discrepancies identified at discharge?

A: Incorrect or omissions in dosage, special instructions, and frequency
B: Incorrect or omissions in dosage, special instructions, and drug name
C: Incorrect or omissions in dosage form, dosage, and frequency.
D: Incorrect or omissions in dosage form, frequency, and drug name.

Q1 Answer: B Q2 Answer: A

IMPLEMENTATION OF A BASAL-BOLUS INSULIN ORDER SET AS A TEST OF CHANGE
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PURPOSE:
In June 2009, The American Association of Clinical Endocrinologists and American Diabetes Association issued a Consensus Statement on Inpatient Glycemic Control. This consensus statement made recommendations for appropriate goals of glycemic control, described protocols for implementation, and illustrated methods of protocol implementation. Several studies reference the glycemic control benefits of basal-bolus insulin as recommended by the guidelines; however, few studies examine implementation of a basal-bolus insulin order set as a test of change. Common barriers to successful implementation of basal bolus insulin protocols cited in previous studies are hesitance of nursing staff to administer insulin based upon proactive protocols lacking a sliding-scale emphasis, alarm over the potential of causing hypoglycemia, as well as apathy regarding hyperglycemia. Education programs and pilot studies were cited as methods of increasing compliance with the basal bolus insulin strategy. This is a pilot study that will determine how implementation of a basal-bolus glycemic control order set, developed using AACE and ADA guidelines, is accepted by nursing and medical staff following an education program.

METHODS:
This is an observational, descriptive, non-interventional study of the effect of education on the outcome of adherence to a basal-bolus insulin regimen. Adherence is defined as correct calculation of insulin doses, agreement between calculated doses and prescribed doses, percent utilization of all order set components, correct dose adjustment, incidence of inappropriate insulin administration, adherence to blood glucose reading schedule, and appropriate utilization of hypoglycemic protocol. Secondary outcomes include percentage of readings within the target range and incidence of hypoglycemia. Excluded were patients with type I diabetes, those with stress induced hyperglycemia without prior diagnosis type II diabetes, patients with severe renal impairment, and pregnant patients.

RESULTS/CONCLUSIONS:
Data collection is in progress. Preliminary results will be reported at the Great Lakes Pharmacy Residency Conference.

LEARNING OBJECTIVES:
Recall appropriate glycemic goals for non-critically ill hospitalized patients.
List barriers to implementation of basal-bolus insulin regimens.

Self Assessment Questions:
The goal fasting/pre-meal blood glucose reading for a non-critically ill hospital patient is:

A: 80-110 mg/dL
B: 90-130 mg/dL
C: <140 mg/dL
D: <180 mg/dL

Basal-bolus insulin regimens are often difficult to implement due to:

A: Lack of evidence for their efficacy
B: High rates of hypoglycemia
C: Superiority of sliding-scale regimens
D: Indifference to hyperglycemia

Q1 Answer: C Q2 Answer: D

ACPE Universal Activity Number 121-999-11-383-L04-P
Activity Type: Knowledge-based Contact Hours: 0.5
VALIDATION OF CURRENT CARBAPENEM RESTRICTION POLICY USING PREDICTORS OF MULTI-DRUG RESISTANCE FOR GRAM-NEGATIVE BACTERIA  
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Background/Purpose: Antimicrobial resistance with gram-negative bacteria is a growing problem in the community and hospitals, affecting first-line choice of antibiotics. The objective of this study is to determine specific risk factors for multi-drug resistant/extended spectrum beta-lactamase (ESBL) producing gram-negative bacteria infections for patients requiring empiric therapy at Saint Joseph Hospital in order to validate the current carbapenem restriction policy.  

Methods: Patients with a positive culture for Pseudomonas spp., Acinetobacter spp., Enterobacter spp., and Klebsiella spp. at SJH in 2009 will be identified by positive culture results by reviewing microbiology census from 2009. Culture and susceptibility reports will be reviewed for susceptibility data. From this information, patients will be stratified into either the "multi-drug resistant organism/ESBL" or "non multi-drug resistant/ESBL" groups. Multi-drug resistant organisms will be defined as those bacteria with resistance to 3 or more classes of antibiotics (beta-lactams, including penicillins, cephalosporins, and monobactams; carbapenems; fluoroquinolones; and aminoglycosides). Patients will be screened for demographic information and common risk factors, including age, sex, drug allergies, past medical history, antibiotic exposure within 90 days, infection site, concurrent infections, past hospitalizations in 90 days, residence, past home infusion therapy, chronic dialysis, home wound care, family member with history of MDR infection, ICU admission on presentation secondary to infection, admission diagnosis, history of MDR infections, APACHE-II score readmission rate of cultures, culture and susceptibility of organism, date of admission, date of positive culture, use of mechanical ventilation, and choice of antimicrobial therapy. Risk factors will be analyzed for commonalities. The carbapenem restriction policy will be validated by dividing patients into two treatment groups (patients receiving treatment with or without a carbapenem) and determining whether initial empiric treatment was appropriate for the organism cultured.  

Results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.  

Learning Objectives:  
Define multi-drug resistant organism and list common risk factors for a multi-drug resistant organism infection.  
Discuss the consequences of infections with multi-drug resistant organisms.  

Self Assessment Questions:  
A multi-drug resistant organism is:  
A: resistant to 3 or more classes of antibiotics (beta-lactams, includin  
B: resistant to 2 or more classes of antibiotics (beta-lactams, includin  
C: resistant to every classe of antibiotics (beta-lactams, includin  
D: resistant to one drug in 3 separate classes of antibiotics (beta-lact  

Consequences of infections with multi-drug resistant organisms include:  
A: Lower health care costs and longer length of stay  
B: Higher health care costs and longer length of stay  
C: Lower health care costs and shorter length of stay  
D: Higher health care costs and shorter length of stay  

Q1 Answer: A  
Q2 Answer: B  

ACPE Universal Activity Number 121-999-11-294 -L01-P  
Activity Type: Knowledge-based  
Contact Hours: 0.5

AZITHROMYCIN VERSUS MOXIFLOXACIN FOR TREATMENT OF ACUTE BACTERIAL EXACERBATIONS OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE  
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Background: At Edward Hines, Jr. VA Hospital, the macrolide azithromycin is the first-line choice of antibiotic for veterans hospitalized with an acute bacterial exacerbation of chronic obstructive pulmonary disease (ABECOPD). Moxifloxacin, a fluoroquinolone, is the second most common antibiotic choice. The GOLD guidelines for COPD recommend macrolides for mild exacerbations and fluoroquinolones for moderate or severe exacerbations. However, a majority of patients who are hospitalized at Hines have moderate to severe exacerbations, thus treatment does not align with the most recent guidelines. Primary literature is conflicting; one meta-analysis found fewer recurrences of exacerbations with quinolones compared to macrolides while a more recent retrospective study showed similar rates of treatment failure. It is currently unknown why the two treatments compare in the veteran population.  

Purpose: The primary objective of this study is to compare the rates of hospital readmission in veterans treated with azithromycin versus moxifloxacin for an acute bacterial exacerbation of COPD.  

Methods: This study is a retrospective chart review of patients admitted to Edward Hines, Jr. VA Hospital for an acute bacterial exacerbation of COPD from 1/1/2000 to 12/31/2010 who were treated with at least 3 doses of azithromycin or moxifloxacin. The primary outcome of the study will be the difference in readmission rates within 30 days of discharge. The study will be conducted with a non-inferiority approach to assess if azithromycin is not inferior to moxifloxacin. It is anticipated that 47 patients in each group will be needed to attain a 15% margin of non-inferiority. Secondary outcomes include time to re-admission within the 30 day follow-up period, a composite of re-admission and mortality, pulmonary function test parameters, oxygen requirements (new versus baseline), arterial blood gas values, and the need for invasive or non-invasive mechanical ventilation.  

Results/Conclusions: Results will be presented at the Great Lakes Pharmacy Resident Conference.  

Learning Objectives:  
Describe the characteristics used by the GOLD guidelines to stratify exacerbation severity and risk for multidrug-resistant organisms for patients with acute exacerbations of COPD.  
List the antimicrobial agents currently recommended for use in acute bacterial exacerbations of COPD.  

Self Assessment Questions:  
Which of the following characteristics is included in the definition of a patient with a moderate COPD exacerbation as described by the GOLD guidelines?  
A: Presence of risk factors for infection with Pseudomonas aeruginos  
B: Treatment with four courses of antibiotics in the past year  
C: No risk factors for poor outcome  
D: Antimicrobial use in the past three months  

Which of the following lists CORRECTLY identifies possible antimicrobial options recommended by the GOLD guidelines for a seven exacerbation?  
A: Oral macrolide, oral beta-lactam, oral cephalosporin  
B: Oral fluoroquinolone, IV fluoroquinolone, IV anti-Pseudomonal bet  
C: Oral beta-lactam, oral fluoroquinolone, IV fluoroquinolone  
D: Oral macrolide, oral fluoroquinolone, IV anti-Pseudomonal beta-lact  

Q1 Answer: D  
Q2 Answer: B  

ACPE Universal Activity Number 121-999-11-110 -L01-P  
Activity Type: Knowledge-based  
Contact Hours: 0.5
Which of the following is the best predictor for vancomycin effectiveness?

A: Peak concentrations  
B: Trough concentrations  
C: AUC/MIC  
D: Serum creatinine

Q1 Answer: C  Q2 Answer: C

**THE EFFECTIVENESS OF THE EDWARD HINES, JR. VA HOSPITAL VTE AND ACS HEPARIN NOMOGRAMS AFTER THE HEPARIN POTENCY CHANGE**

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**Background:** The United States Pharmacopeia monograph for unfractionated heparin (UFH) recently changed, resulting in a 10% reduction in potency. This change in heparin potency has increased the incidence of treatment failures and increasing vancomycin resistance. The treatment failure rate with vancomycin therapy in adults, however, pediatric data is limited. Current pediatric dosing recommendations will not achieve the recommended AUC/MIC and it remains unclear whether achieving higher vancomycin trough concentrations (VTC) are required for successful treatment outcomes.

**Purpose:** The primary purpose of this study is to determine the effectiveness of the Edward Hines, Jr. VA Hospital venous thromboembolism (VTE) and acute coronary syndrome (ACS) heparin nomograms after the heparin potency change. The primary outcome of this study is to determine the time to therapeutic activated partial thromboplastin time (aPTT). The secondary outcomes of this study include classification of aPTT levels, accuracy of heparin dose and rate adjustments, number of re-boluses, average time between each aPTT, and safety parameters before and after the change in heparin potency.

A subanalysis will compare the time to therapeutic aPTT in obese patients.

**Methods:** This observational chart review will include patients who are > 18 years of age, received a heparin bolus using a 1000 unit/mL vial between 5/1/09-1/31/10 (before the potency change) or 5/1/10-1/31/11 (after the potency change), and achieved a therapeutic aPTT. Data collection included patient demographics, chief complaint, indication for heparin, initial bolus amount and drip rate, aPTT values and thromboplastin time (aPTT). The secondary outcomes of this study include classification of aPTT levels, accuracy of heparin dose and rate adjustments, number of re-boluses, average time between each aPTT, and safety parameters before and after the change in heparin potency.

**Results/Conclusions:** Data collection is in progress. Results will be presented at the Great Lakes Pharmacy Resident Conference.

**Learning Objectives:**

Describe the heparin potency change and the FDA’s recommendation for heparin dosing.

Recognize the aPTT values considered therapeutic according to the Edward Hines, Jr. VA Hospital’s VTE and ACS heparin nomograms.

**Self Assessment Questions:**

In light of the heparin potency change, the FDA recommended which change to heparin dosing?

A: A 10% increase in dose because there was a 10% reduction in potency  
B: A 10% decrease in dose because there was a 10% reduction in potency  
C: No change in dose because the change in potency is negligible  
D: No change in dose because there is a lack of clinical data to support the change

Which of the following aPTT ranges are therapeutic according to the Edward Hines, Jr. VA Hospital VTE heparin nomogram?

A: 43-61 seconds  
B: 44-57 seconds  
C: 58-95 seconds  
D: 96-114 seconds

**Activity Type:** Knowledge-based  
**Contact Hours:** 0.5

**ACPE Universal Activity Number:** 121-999-11-366 -L04-P

**Activity Type:** Knowledge-based  
**Contact Hours:** 0.5
ASSOCIATION OF CURRENT MEDICATION TEACHING PRACTICES AT UC HEALTH - UNIVERSITY HOSPITAL IN NEW SOLID ORGAN TRANSPLANT RECIPIENTS
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PURPOSE: Nonadherence to medications is related to morbidity and mortality in the solid organ transplant population resulting from hospitalization, chronic illness progression, graft failure, and death. Rates of nonadherence with immunosuppressants are reported to be 20% or higher. Existing studies have analyzed various patient factors and barriers in medication adherence. Additionally, inadequate pre-transplant education has been listed as a factor that can predispose patients to medication nonadherence. Various methods have been implemented to increase patient medication knowledge. Current medication teaching practices at UC Health - University Hospita include multidisciplinary educational sessions prior to transplant, pharmacist or nurse-driven medication counseling, and patient participation in the self-medication program (SMP). The effectiveness of current medication teaching practices at UC Health - University Hospital has not been formally evaluated. The purpose of this project is to evaluate transplant recipient medication knowledge, ability to self-medicate via SMP upon discharge, and assessment of teaching practices at UC Health - University Hospital. Information gathered will aid in the determination of recipient medication knowledge deficits and areas of improvement in medication teaching practices to enhance patient medication knowledge.

METHODS: This investigator-initiated, single-center, prospective evaluation will be conducted in first-time kidney, kidney-pancreas, and liver transplant recipients enrolled between January 2011 and April 2011. Assessment of transplant recipient knowledge of medications is performed through administration of verbal quizzes given prior to formal counseling and/or enrollment in SMP, following participation in the SMP and prior to discharge, and around 30 day post-transplant clinic follow-up. Daily nursing assessment of patient SMP participation and accuracy will be collected. Recipient assessment of medication teaching practices will be assessed through administration of a 19-item survey answered using a 5-point Likert scale.

RESULTS/CONCLUSIONS: Data collection is in process. Results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Identify patient barriers in medication adherence and learning. Recognize the role of pharmacists in patient education.

Self Assessment Questions:
Medication nonadherence in solid organ transplant has been associated with:
A Increased graft dysfunction
B Increased mortality
C Decreased overall healthcare costs
D A&B
Which of the following statements illustrate a barrier for medication adherence in transplant recipients?
A A patient prescribed affordable medications
B A patient prescribed a medication regimen with few side effects
C A patient prescribed a medication regimen with multiple dosing schedules
D A patient adherent to medications prior to transplant
Q1 Answer: D Q2 Answer: C

ACPE Universal Activity Number 121-999-11-430-L04-P
Activity Type: Knowledge-based Contact Hours: 0.5

INCIDENCE OF BLEEDING IN RENAL-IMPAIRED PERCUTANEOUS CORONARY INTERVENTION PATIENTS RECEIVING INCORRECTLY-DOSED EPTIFIBATIDE OR BIVALIRUDIN
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Purpose: Bivalirudin (Angiomax) and eptifibatide (Integritin) have both been shown to provide clinical benefits when used in percutaneous coronary intervention (PCI) and are routinely used at the University of Toledo Medical Center (UTMC) during cardiac catheterizations. The Joint Commission National Patient Safety Goals 2010 challenges accredited hospitals to reduce the likelihood of patient harm associated with the use of anticoagulation therapy. Bleeding complications are associated with patient discomfort, increased hospital length of stay, worsened morbidity, and increased costs. This risk appears to be substantially increased when anticoagulants, such as bivalirudin and eptifibatide, are not dose-adjusted based on renal function. This retrospective study will evaluate the bleeding incidence in patients with decreased renal function undergoing a percutaneous coronary intervention at UTMC that received either bivalirudin or eptifibatide dose incorrectly based on manufacturer recommendations.

Methodology: A retrospective chart review will review bleeding complications in renally impaired patients that underwent a PCI involving the use of bivalirudin or eptifibatide between January 1, 2008, and August 31, 2010. Patients included had a baseline calculated GFR less than 60 ml/min, were 18 years or older, and received bivalirudin or eptifibatide during a cardiac catheterization for PCI. Patients were excluded if pregnant or did not meet inclusion criteria. Information on patient demographics, home medications, and baseline lab values will be collected using the UTMC electronic medical record system. The primary endpoint of the study will compare the incidence of bleeding during hospital stay in patients incorrectly dosed with those correctly dosed according to renal function based on manufacturer recommendations. Secondary endpoints will look at the percentage of time patients are dosed correctly, and compare incidence of major bleeding in patients dosed incorrectly to those dosed correctly.

Results and conclusions: Data collection is currently in progress and will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Identify the possible complications of improper dosing of antithrombotic or antiplatelet therapy.
Recall the appropriate dosing of eptifibatide and bivalirudin based on patient renal function.

Self Assessment Questions:
What is a possible consequence of inappropriate antithrombotic or antiplatelet therapy during PCI?
A Thrombosis
B Pancytopenia
C Bleeding
D A & C

The following dosing would be appropriate in a 60 year old female PCI patient with a calculated creatinine clearance of 40 ml/min.
A Eptifibatide 180mcg bolus, followed by 1 mcg/kg/min infusion
B Eptifibatide 180mcg bolus followed by 2mcg/kg/min infusion
C Bivalirudin 0.75mg/kg bolus, followed by 1.75 mg/kg/hr infusion
D Bivalirudin 1.0 mg/kg bolus, followed by 1.25 mg/kg/hr infusion
Q1 Answer: D Q2 Answer: C

ACPE Universal Activity Number 121-999-11-303-L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
EVALUATION OF A PEDIATRIC ANTIMICROBIAL STEWARDSHIP PROGRAM BY ASSESSING THE APPROPRIATENESS OF TARGET ANTIBACTERIAL USE
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Purpose:
Inappropriate antimicrobial prescribing can lead to increased bacterial resistance, health care costs, and morbidity and mortality. Fewer antimicrobial options are available in children due to limited pharmacokinetic data and the potential for increased drug toxicities. Antimicrobial stewardship programs have been implemented to optimize use of available antimicrobials. To date, few studies have evaluated the appropriate use of antibiotics in adults. However, limited studies have applied appropriate use criteria antibiotics used in a pediatric population. The purpose of this study is to determine the rate at which target antibacterial agents are being used appropriately in a pediatric population before and after implementation of an antibiotic stewardship intervention.

Methods:
This was a prospective study of patients, 18 years or younger, admitted to a tertiary pediatric hospital and having received greater than 72 hours of vancomycin, piperacillin/tazobactam, cefepime, or meropenem. Patients were identified using daily pharmacy reports. Appropriateness algorithms were developed for each antimicrobial to assess appropriate use based on patients’ blood cultures, indication, and overall clinical status.

Patient characteristics will be assessed using the patients electronic medical record and clinical status. Following the initial evaluation of appropriateness, both physicians and pharmacists will be educated on appropriate antimicrobial prescribing criteria. A second evaluation will be conducted to assess appropriateness of target antimicrobial agent prescribing following practitioner education.

Descriptive statistics will be performed to determine baseline demographics of the study population. A chi-square analysis will be conducted to compare rates of appropriateness pre- and post implementation of the appropriateness indexes.

Results and Conclusion:
To follow pending completion of data collection and analysis

Learning Objectives:
Recognize the risks associated with inappropriate antimicrobial use in a pediatric population.
Describe potential criteria to assess the appropriateness of target antibiotics continued beyond 72 hours of therapy.

Self Assessment Questions:
Which of the following limits antimicrobial prescribing in pediatric patients?
A: Multitude of pharmacokinetic studies
B: Decreased risk of drug toxicity
C: Limited agents to combat multi-drug resistant organisms
D: There are no limitations in prescribing antimicrobial agents in pediatrics

Which of the following could serve as potential criteria to assess appropriateness of vancomycin continued beyond 72 hours of therapy?
A: A patient without any drug allergies
B: A patient with a history of MRSA
C: A patient with a positive blood culture caused by a gram negative organism
D: A patient without any signs of infection

Q1 Answer: C Q2 Answer: B

ACPE Universal Activity Number 121-999-11-182 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

ESTABLISHMENT OF A PHARMACY RESIDENCY PRECEPTOR DEVELOPMENT NETWORK
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Purpose:
Per the American Society of Health Systems Pharmacists (ASHP) Residency Accreditation Standards, pharmacy residency programs must provide preceptors with opportunities to enhance their teaching skills, and the program must have and utilize a plan to improve preceptor instruction. Many residency programs do not have the budget or resources to finance continuing development of preceptors. The goal of this project is to establish a preceptor development program for pharmacy residency preceptors at Trinity Health institutions, making use of the skills of preceptors within the Trinity system to educate other preceptors.

Methods:
Prior to the start of this project, approval was obtained from the Saint Joseph Regional Medical Center Institutional Review Board. An initial survey was sent to pharmacy residency program directors at institutions within Trinity Health. Results were used to determine each program’s interest in participating in the project, what each site’s current preceptor development entails, and what topics would be of value to cover in preceptor development sessions. Throughout the year, four video teleconferencing sessions will be held to provide education or discussion on identified topics. Preceptors will present topics or lead discussions based on their interests and areas of expertise. Following each video teleconferencing session, preceptors who participated will receive a certificate of completion. In addition, they will be asked to provide feedback on the session through a brief survey. Participants will be asked to evaluate the effectiveness of the speaker, the usefulness of the session, and possible topics for future sessions. Following the final session, residency directors will be asked to complete an economic evaluation to determine whether any cost savings are associated with participation in a preceptor development network.

Results:
Implementation of the video teleconferencing sessions and data collection are in progress. Final results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Recognize potential benefits of implementing a preceptor development network.
Identify potential barriers to implementing a preceptor development network.

Self Assessment Questions:
Which of the following is an ASHP standard related to preceptor development?
A: To provide preceptors with opportunities to enhance their teaching
B: To ensure that all preceptors teach at a school of pharmacy
C: To have an utilize a plan to improve preceptor instruction
D: A and C

Which of the following barriers were encountered during the creation of this preceptor development network?
A: Technology set-up and identifying speakers
B: Identifying topics and technology set-up
C: Gaining support for the project and identifying topics
D: Identifying speakers and gaining support for the project

Q1 Answer: D Q2 Answer: A

ACPE Universal Activity Number 121-999-11-416 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5
Which of the following agents has the MOST available evidence to treat patients in the ICU?

A: Haloperidol  B: Lorazepam  C: Dexametomidine  D: Olanzapine

Q1 Answer: C  Q2 Answer: A
HYPERTENSION GROUP CLINIC

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Purpose: According to data published by the American Heart Association, 33.6% of adults, twenty years or older, in the US have hypertension. Of these, 68% were taking medications to treat blood pressure. Only 44% of treated persons were controlled. Hypertension increases patients risk for cardiovascular disease, heart failure, stroke, and kidney disease. Traditional care may not work for all patients. Therefore, it is important to provide patients with alternative ways of managing their chronic conditions, such as a group clinic setting. The purpose of this study is to develop and evaluate an interdisciplinary group hypertension clinic at the Milwaukee VAMC.

Methods: The investigators will develop and implement a group hypertension clinic and then analyze satisfaction scores through an allied health provider survey. Primary care patients with uncontrolled blood pressure (not meeting goals of <140/90 or <130/80 if diabetic or have chronic kidney disease) from the Milwaukee VA will be eligible for participation in the study. Exclusion criteria include conditions that make patients inappropriate for group settings, management by an outside provider, purchasing blood pressure medications from a non-VA pharmacy, receiving dialysis, or in hospice/palliative care. Participants will be referred by their primary care provider or by a primary care pharmacist. The clinic will meet twice a month lasting approximately one hour. The patients will be seen on a monthly basis with the option to be seen twice a month if necessary. Two groups with a maximum of ten patients each will be established for this study. Data collection will consist of a survey distributed to allied health providers who participate in the clinic after at least one session has occurred. The survey will focus on allied health provider satisfaction and perceived patient satisfaction to determine if the clinic is appropriate.

Results/Conclusions: The study is currently in progress.

Learning Objectives:
Discuss general blood pressure information that is communicated to the patients during the clinic.
Identify barriers to developing a group hypertension clinic and areas for future improvement.

Self Assessment Questions:
Which of the following is the blood pressure goal for patients with chronic kidney disease?
A: <130/85
B: <140/90
C: <130/80
D: <140/80

Hypertension increases patients risk for developing all of the following except:
A: Heart failure
B: Stroke
C: Kidney disease
D: Diabetes

Q1 Answer: C  Q2 Answer: D

ACPE Universal Activity Number 121-999-11-181 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
EVALUATION OF THE MANAGEMENT OF SUSPECTED HEPARIN-INDUCED THROMBOCYTOPENIA USING A CLINICAL PRE-TEST PROBABILITY SCORE

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Background:
Heparin-induced thrombocytopenia (HIT) is a clinicopathologic syndrome for which laboratory testing alone is insufficient to make a diagnosis due to the limited specificity and sensitivity of available tests and slow turnaround time of results. Rapid decisions are needed when HIT is suspected because patients can suffer undue harm without prompt management. Therapies to treat HIT are costly and associated with risks of their own. In 2003, a scoring system using clinical features characteristic of HIT (“The 4Ts”: Thrombocytopenia, Timing of platelet count fall, Thrombosis, and Other possible causes) was proposed. This system is recommended to stratify a patient’s probability of HIT and determine a management plan.

Purpose:
To determine the association between the 4Ts pre-test probability of HIT and interventions pursued in patients with suspected HIT at Akron General Medical Center (AGMC).

Methods:
This is an IRB-approved retrospective chart review of patients with suspected HIT at AGMC. Patients were included if they received HIT-specific laboratory testing and/or received argatroban, bivalirudin or fondaparinux in the setting of suspected HIT. Patients were excluded if they were less than 18 years of age or pertinent data was missing from records. Data collected included patient demographics, use of alternative anticoagulation, type and result of HIT-specific testing, and information necessary to calculate the 4Ts score. Each patient’s probability of HIT was determined based on the 4Ts score. The primary endpoint was the odds of intermediate/high probability patients compared to low probability patients receiving empiric alternative anticoagulation. Secondary endpoints included: the odds of intermediate/high probability patients compared to low probability patients receiving both empiric alternative anticoagulation and HIT-specific laboratory testing or testing alone, the proportion of patients with positive laboratory testing in each probability group, and anticoagulation prescribing patterns after laboratory results were known.

Results and Conclusions:
Data analysis in progress, results to be presented.

Learning Objectives:
Name the four clinical features used to calculate the 4Ts score.
Describe the proper management of patients with HIT.

Self Assessment Questions:
Which of the following is used in calculating the 4Ts score?
A: Therapeutic dose of heparin
B: Timing of platelet count fall
C: Treatment with argatroban
D: Test results

Which of the following agents can be safely used as initial treatment for HIT?
A: Enoxaparin
B: Warfarin
C: Argatroban
D: Dalteparin

ASSOCIATION BETWEEN CATECHOLAMINE DOSE AT CORTICOSTEROID INITIATION AND SHOCK REVERSAL IN PATIENTS WITH SEPTIC SHOCK

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Background:
Septic shock is the tenth leading cause of death in the United States and the most common cause of death in the intensive care unit (ICU). Moderate doses of hydrocortisone improve catecholamine response and have anti-inflammatory effects. Intravenous corticosteroids decrease the time to shock reversal and are recommended for use in adult septic shock patients with hypotension that is poorly responsive to adequate fluid resuscitation and vasopressors. However, the definition of “poorly responsive” is unclear, and the vasopressor dose prompting initiation of corticosteroids remains dependent upon individual prescriber practice.

Purpose:
The primary endpoint of this study is to determine if an association exists between the catecholamine dose at the time hydrocortisone initiation and 7-day shock free survival. A secondary endpoint will be to determine if the catecholamine dose at the time of hydrocortisone initiation is associated with 28-day mortality.

Methodology:
A non-interventional, retrospective cohort study of 106 patients will be conducted. Patients will be included if they are admitted to the medical intensive care unit with septic shock and receive intravenous hydrocortisone 200-300 mg/day along with vasopressors and antibiotics. Patients will be excluded if there is evidence of previous systemic steroids use within 90 days. On the day of hydrocortisone initiation, the following data will be collected: demographic information, the dose of each vasoactive medication at the time of initial fixed corticosteroid dose administration and criteria necessary to calculate the Acute Physiology and Chronic Health Evaluation Score (APACHE II) and Sequential Organ Failure Assessment (SOFA) scores. Hemodynamic status at day 7 as well as ICU and hospital mortality rate will be assessed. Logistic regression will be utilized to assess for an association between catecholamine dose at the time of hydrocortisone initiation and 7-day shock free survival.

Results:
Preliminary results from ongoing data collection will be presented.

Learning Objectives:
Explain the pathophysiology of septic shock.
Describe the rationale for corticosteroids use in septic shock.

Self Assessment Questions:
Septic shock is best described as...
A: a systemic inflammatory response syndrome
B: an infection eliciting a systemic inflammatory response
C: a multiple organ dysfunction syndrome secondary to an infection
D: severe sepsis with hypotension despite adequate fluids and vasopressors

Which of the following is an indication for using corticosteroids in septic shock?
A: Acute respiratory distress syndrome (ARDS)
B: Pneumonia
C: Sepsis with adrenal insufficiency responding to adequate fluid resuscitation
D: Vasopressor-dependent septic shock

Q1 Answer: D Q2 Answer: D
ACPE Universal Activity Number 121-999-11-338-L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
COMMUNITY PHARMACY EDUCATIONAL INTERVENTION AND IMPACT ON VITAMIN D STATUS ASSESSMENT AND USE OF SUPPLEMENTS

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Objective: To evaluate impact of a community pharmacist-provided vitamin D intervention on prevalence of vitamin D status assessment and use of vitamin D supplements in an adult population.

Methods: Pharmacists practicing at an independent pharmacy developed a vitamin D educational intervention for study. Patients 18 years of age or older will be eligible for participation and randomized to a face-to-face educational intervention group or control group. Exclusion criteria include: osteoporosis, pregnancy, and chronic kidney disease. After consent, pharmacist investigators will interview participants to collect demographics and assess previous vitamin D status assessment and current use of vitamin D-containing supplements. The intervention group will receive a 10-minute education intervention from a pharmacist. One month after the initial interview, patients in both groups will be contacted by telephone to complete a follow-up interview. This will determine if additional participants had their vitamin D status assessed or still intend to have it assessed, and/or started taking a vitamin D-containing supplement. Questions will also evaluate perceived barriers to vitamin D status assessment and/or use of vitamin D-containing supplements, including access, lack of knowledge, and cost. Given the short follow-up time period, the primary outcome measure will be participants intention to complete assessment in the two groups. A sample size of 108 (54 participants per group) will be required.

Results (Preliminary): To date, 40 participants have been enrolled and completed the initial interview. Participants are predominately white (n=39) and male (n=23). At baseline, 15 participants (37.5%) previously completed the initial interview. Participants are predominately white and female. At baseline, 15 participants (37.5%) previously had their vitamin D status assessed (n=7 in control group vs. n=8 in intervention group).

Conclusion: Pharmacists are accessible health care providers who can provide screening and interventional services for common, high impact conditions. Investigators anticipate that pharmacist-induced education may increase the prevalence of both vitamin D status assessment and use of vitamin D-containing supplements.

Learning Objectives:
Describe the current recommendations for vitamin D intake and available options for supplementation.
Discuss how a physician can assess a patient's vitamin D status.

Self Assessment Questions:
Which of the following statements is correct?
A: Vitamin D is a water-soluble vitamin.
B: The recommended daily intake of vitamin D for an individual less than 50 years diagnosed with a Gram-negative bacteremia (GNB).
C: The recommended daily intake of vitamin D for an individual greater than 50 years.
D: Natural sources of vitamin D include vegetables, such as spinach.

Which of the following statements is correct?
A: A physician can assess a patient's vitamin D status by ordering a vitamin D blood test.
B: Corticosteroids can reduce a patient's risk of developing vitamin D deficiency.
C: Direct sun exposure can increase a patient's risk of developing vitamin D deficiency.
D: A prescription is required for all products containing greater than 1 microgram of vitamin D.

Q1 Answer: B Q2 Answer: A

ACPE Universal Activity Number 121-999-11-265 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

EVALUATION OF AN ANTI-MICROBIAL STEWARDSHIP DE-ESCALATION PROGRAM FOR GRAM-NEGATIVE BACTEREMIA

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Background
Despite the ongoing efforts of antimicrobial stewardship, an unfortunate cycle has been created. As drug-resistant pathogens have increased over the years, the overuse of broad-spectrum empiric antimicrobials is often required which contributes to the rise in resistant pathogens. De-escalation is a method that may help break this cycle. De-escalation involves the practice of starting with an empiric broad-spectrum antibiotic regimen based on guidelines, antibiograms and the patients clinical level of severity and then switching the patient to a narrow spectrum antibiotic once culture and susceptibility results are available. De-escalation not only reduces the potential for antimicrobial resistance but also minimizes toxicity associated with antimicrobial exposures and contributes to lowering patient costs.

Purpose
The purpose is to evaluate the impact of an antimicrobial stewardship driven de-escalation program on patients with Gram-negative bacteremia.

Methods
This is a retrospective observational study evaluating de-escalation therapy in patients that are ≥ 18 and ≤ 89 years diagnosed with a Gram-negative bacteremia (GNB). The control group comprises patients with GNB from 2006-2009. The experimental group consists of patients being treated from December 1, 2010 to April 30, 2011 for which de-escalation interventions were made within ≤ 24 hours of the culture and susceptibility data being released. Data collection includes age, gender, race, Charlson Score, Pitt Bacteremia score, days of leukocytosis, bacteremia, and temperature, length of stay, source of bacteremia, and antibiotics used will be collected. Clinical outcomes evaluated will be duration of fever, leukocytosis, and bacteremia related to GNB, length of antimicrobial therapy, length of hospital stay after the onset of GNB, 30-day mortality and hospital-associated costs. A sub-analysis will be conducted on patients who have had a recommendation to de-escalate therapy by an infectious diseases trained pharmacist but denied by the attending physician.

Results
Results and conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:
Identify key components involved in de-escalation therapy that can benefit the patient and hospital by decreasing unnecessary drug exposures, resistance, and costs.
Discuss outcomes of patients with GNB associated with de-escalation of antimicrobials.

Self Assessment Questions:
Antimicrobial Stewardship Programs (ASP) have been developed specifically for the purpose of:
A: Improving patient outcomes by optimizing antimicrobial exposures
B: Reducing patient adverse events
C: Decreasing the development of antimicrobial resistance while providing optimal care
D: All the above

De-escalation therapy can lead to:
A: Increasing unnecessary drug exposures
B: Increasing hospital costs
C: Decreasing resistant bacterial strains
D: All the above

Q1 Answer: D Q2 Answer: C

ACPE Universal Activity Number 121-999-11-099 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
EFFICACY OF RASBURICASE IN ADULT AND PEDIATRIC PATIENTS
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Purpose
The timely management of hyperuricemia is critical in preventing precipitation of uric acid crystals in the renal tubules and distal collecting ducts. At the University of Michigan Health Systems (UMHS), both the adult and pediatric hospitals have employed a policy change that requires a fixed dose of rasburicase for patients with elevated uric acid levels. The primary objective of this study is to evaluate the number of additional doses needed to treat or prevent hyperuricemia within five days of the initial dose.

Secondary objectives for this study include comparing the ability of a fixed-dose of rasburicase with weight-based dosing to reduce uric acid levels in adult and pediatric patients as well as determining the cost savings provided by a fixed-dose regimen.

Methods
This retrospective chart review was approved by the Institutional Review Board. The health system’s electronic medical record system will be used to identify patients who received rasburicase in a specified period prior to policy implementation (adult patients: January 1, 2008 to December 31, 2008; pediatric patients: October 1, 2008 to March 31, 2009) and after policy implementation (adult patients: January 1, 2009 to December 31, 2009; pediatric patients: April 1, 2009 to September 30, 2009). All patients who received rasburicase during the specified time frame will be included except those who were treated according to their study protocol. The following information will be gathered: case date, age, weight (kg), malignancy, chemotherapeutic agents used, uric acid level (pre- and post-treatment), median uric acid levels, mean uric acid reduction, rasburicase dose, number of doses needed to achieve normalized uric acid, cost, tumor lysis syndrome (TLS) characteristics (serum creatinine, potassium, phosphorous, calcium, lactate dehydrogenase), patients level of risk for TLS (low, intermediate, high).

The primary objective of this study is to evaluate the number of additional doses needed to treat or prevent hyperuricemia within five days of the initial dose.

ENHANCING MEDICATION THERAPY MANAGEMENT SERVICES IN THE OUTPATIENT PHARMACIES AT FROEDTERT HOSPITAL
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Purpose: Research indicates pharmacist-provided medication therapy management (MTM) services optimize disease state management and decrease healthcare costs. Froedtert Hospital pharmacists provide medication therapy management services to select patients but offer limited reimbursable MTM services to the general population. As a result of the project, MTM services will be incorporated into the pharmacy workflow. The primary outcome is to improve the quality of care as evidenced by the number and types of interventions made. A financial analysis of MTM services will be conducted and patient and staff satisfaction will be assessed.

Methods: Outcomes Pharmaceutical Healthcare is utilized as the primary platform for MTM services. Additionally, Wisconsin Pharmacy Quality Collaborative (WPQC) “best practice standards” guide the MTM process. Due to the quality improvement nature of the project, investigational review board approval was not necessary. All outpatient pharmacists are trained on Outcomes and MTM processes. Eligible patients are identified in the Outcomes system and flagged in the outpatient computer system. Discharge pharmacists identify patients prospectively during discharge counseling. MTM services are marketed and comprehensive medication reviews are scheduled by residents. One on-one comprehensive medication reviews are performed and interventions made during normal prescription processing are recorded. Patient satisfaction surveys will be mailed to patients whom a comprehensive medication review was performed.

Preliminary Results: MTM services are well-received by Froedtert pharmacists with 100% of pharmacists expressing interest in providing MTM services. The pharmacist satisfaction survey indicated workflow as the main barrier to full implementation of MTM services. Seventy eligible patients were identified, seven comprehensive medication reviews were performed, and 19 interventions were made, two were completed during prescription processing. Reimbursement for services totaled $680 avoiding an estimated $48,720.40 in healthcare costs. Pharmacist time and workflow barriers continue to be investigated.

Conclusion: MTM services improve the quality of care and provide reimbursement in the outpatient setting.

Learning Objectives:
Describe the process for the implementation of Medication Therapy Management Services.

Self Assessment Questions:
Which of the following best describes the mechanism of action of rasburicase to reduce uric acid?
A Rasburicase inhibits xanthine oxidase and prevents the formation of uric acid
B Rasburicase converts uric acid to allantoin which is 5-10x more soluble
C Rasburicase prevents the formation of uric acid by inhibiting the metabolism of hypoxanthine
D Rasburicase alkalizes urine and thus increases the solubility of uric acid

Q1 Answer: C Q2 Answer: B

ACPE Universal Activity Number 121-999-11-314-L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
SAFETY AND EFFICACY OF DALTEPARIN VERSUS UNFRACTIONATED HEPARIN FOR THE PREVENTION OF VENOUS THROMBOEMBOLISM IN PATIENTS WITH TRAUMATIC BRAIN INJURY


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Purpose:
Patients who suffer traumatic brain injury (TBI) are at an increased risk of developing venous thromboembolism (VTE). Current Brain Trauma Foundation guidelines recommend pharmacological VTE prophylaxis with either unfractionated heparin (UFH) or a low-molecular weight heparin (LMWH) in addition to mechanical prophylaxis. Local practice at University Hospital suggests that the intensive care unit to which a patient is admitted dictates the agent used for VTE prophylaxis. Patients with isolated TBI admitted to the neuroscience intensive care unit (NSICU) are usually prescribed UFH while patients with multiple injuries are usually admitted by the trauma service to the surgical intensive care unit (SICU) and prescribed the institutions formulary LMWH, dalteparin, for VTE prevention. The purpose of the study is to characterize the safety and efficacy profiles of UFH and dalteparin for use in VTE prophylaxis in patients with TBI.

Methods:
This single-center investigator-initiated retrospective study examined 251 patients admitted with blunt TBI admitted to UC Health-University Hospital prior to September 2010. Eligible patients included those at least eighteen years old who were admitted to either the NSICU or the SICU for >48 hours and received either UFH or dalteparin for VTE prevention. Other inclusion criteria were head abbreviated injury score (AIS) >2, risk assessment profile (RAP) score of ≥5, as well as formal assessment for VTE. Pregnant women and prisoners were excluded. Patients were identified using the hospitals trauma registry as well as pharmacy billing records. The primary outcome was the incidence of VTE during hospitalization. Secondary safety outcomes included expansion of intracranial hemorrage, need for additional neurosurgical intervention, and number of episodes of clinically significant bleeding after initiation of anticoagulation, as well as all-cause mortality during hospitalization.

Results:
Results and conclusions are pending and will be presented at the Great Lakes Regional Pharmacy Conference.

Learning Objectives:
Identify risk factors that place patients with traumatic brain injury (TBI) at high risk for developing venous thromboembolism (VTE).
Discuss current guidelines and literature surrounding the use of VTE prophylaxis in patients with TBI.

Self Assessment Questions:
Which of the following factors places a trauma patient at increased risk of developing VTE?
A: Glasgow Coma Score >8
B: Operation lasting <2 hours
C: Head AIS >2
D: Age <40

Which of the following is recommended for use in VTE prevention in all patients with TBI?
A: Unfractionated heparin
B: Low molecular weight heparin
C: IVC filter
D: Mechanical compression device

Q1 Answer: C Q2 Answer: D

ACPE Universal Activity Number 121-999-11-258 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

EVALUATING THE INCIDENCE OF INVASIVE FUNGAL DISEASE IN ACUTE MYELOID LEUKEMIA PATIENTS RECEIVING DECITABINE WITH FLUCONAZOLE VERSUS POSACONAZOLE PROPHYLAXIS

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Purpose:
Elderly patients with acute myeloid leukemia (AML) are likely to have poor-risk cytogenetics and are often not candidates for intensive chemotherapy due to co-morbid illness and poor performance status. Others refuse intensive chemotherapy secondary to high toxicity and low efficacy. Decitabine is a nucleoside analog that induces hypomethylation of DNA and differentiation of hematopoietic cells. In elderly AML patients, induction with decitabine 20 mg/m2/day IV on days 1-10 of a 28 day cycle is administered. The primary toxicities of this regimen include prolonged myelosuppression and delayed neutrophil nadir.

Patients with prolonged neutropenia resulting from AML and decitabine therapy are at high risk for invasive fungal disease (IFD). Antifungal prophylaxis is recommended because the diagnosis of IFD is often delayed and antifungal treatment delays increase mortality. There is no data published describing the incidence of IFD in AML patients receiving decitabine. The primary objective of this retrospective review is to compare the incidence of proven or probable IFD in patients receiving either fluconazole or posaconazole prophylaxis during decitabine induction. Secondary objectives include identifying risk factors associated with IFD.

Methods:
AML patients receiving decitabine induction will be identified and the following data will be collected: demographics, cytogenetics, blast count at AML diagnosis, number of decitabine cycles completed, duration of neutropenia, response achieved, antifungal therapy, change in antifungal therapy, and IFD risk factors. Proven and probable IFD will be characterized according to European Organisation for the Research and Treatment of Cancer and the Mycoses Study Group criteria. An infectious disease physician and a hematologist will independently review cases to confirm proven and probable cases of IFD.

Results and Conclusion:
Data collection and analysis are ongoing. Final results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Identify risk factors associated with invasive fungal disease in acute myeloid leukemia patients.
Review antifungal prophylaxis guidelines and literature in acute myeloid leukemia patients.

Self Assessment Questions:
Risk factors for invasive fungal disease include the following:
A: Broad spectrum antibiotic therapy for ≥4 days (ex. piperacillin/tazobactam)
B: Central venous catheterization
C: Administration of steroids for the prevention of chemotherapy-induced nausea and vomiting
D: A and B

Which of the following antifungal agents are approved by the Food and Drug Administration for prophylaxis of disseminated candidiasis and invasive aspergillosis in acute myeloid leukemia patients?
A: Posaconazole
B: Fluconazole
C: Micafungin
D: Amphotericin B

Q1 Answer: D Q2 Answer: A

ACPE Universal Activity Number 121-999-11-197 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
LEARNER LEADERSHIP WORKSHOP
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Purpose: The purpose of this session is to address the current state of leadership in healthcare today and provide participants with strategies for becoming effective leaders within the pharmacy practice setting.

Activities: This session will include a presentation on current healthcare leadership trends, followed by a group discussion on how these trends impact pharmacy practice. Participants will have the opportunity to develop action plans for implementing leadership strategies in their own practice settings.

Learning Objectives:
1. Identify current trends in healthcare leadership
2. Develop strategies for effective leadership in pharmacy practice
3. Create an action plan for implementing leadership strategies in practice

Self Assessment Questions:
1. Which of the following is a benefit of effective leadership in healthcare?
   A. Improved patient outcomes
   B. Increased staff turnover
   C. Decreased healthcare costs
   D. Increased administrative burden

2. What is one effective way to illustrate leadership within the pharmacy practice setting?
   A. Implementing a new patient education program
   B. Reducing staff turnover rates
   C. Increasing the number of pharmacy services provided
   D. Decreasing the number of non-value-added tasks

3. How might effective leadership impact the pharmacy practice setting?
   A. Reduced staff satisfaction
   B. Increased patient satisfaction
   C. Increased costs
   D. Decreased efficiency

Activity Type: Knowledge-based
Contact Hours: 0.5
BACKGROUND: Overweight and obese (O/O) pediatric patients present a unique challenge in antibiotic dosing as excess body weight may lead to pharmacokinetic alterations. "Overweight" is defined as BMI-for-age ≥ 85th percentile while "obese" is defined as BMI-for-age ≥ 95th percentile. Nationwide, and at our hospital, the percentage of O/O children is increasing.

PURPOSE: The purpose of the study is to characterize and evaluate current aminoglycoside dosing regimens in overweight and obese pediatric patients.

METHODS: The study is a retrospective, cohort design over a 6-month period from January to June 2010. Inclusion criteria includes O/O patients ages 2-17 years who have received IV aminoglycoside therapy (gentamicin, tobramycin, amikacin). Exclusions include patients with cystic fibrosis or on renal replacement therapy.

Initial data (drug, dose, interval, medical record number, height, weight, age, sex) was obtained via electronic medical records. Subsequent data collection obtained from chart review included BMI-for-age, SCR, BUN, duration of therapy, cultures, susceptibilities, serum levels, and dosage changes.

RESULTS: Preliminary results indicate 267 total orders for IV aminoglycosides and 173 total courses of therapy. 82 of 173 (47.4%) courses were classified as "overweight and obese" while 43 of 173 courses (24.9%) were defined as "obese."

CONCLUSIONS: Additional results and conclusions are pending and will be presented at a later date.

Learning Objectives:
- Define the term "BMI-for-age" and the percentiles for overweight and obese pediatric patients.
- Recognize how aminoglycoside pharmacokinetics can be altered in overweight and obese pediatric patients.

Self Assessment Questions:
Which of the following includes the correct definitions of "overweight" and "obese"?

A: "Overweight" is BMI-for-age ≥ 75th percentile; "obese" is BMI-for-age ≥ 90th percentile.
B: "Overweight" is BMI-for-age ≥ 75th percentile; "obese" is BMI-for-age ≥ 95th percentile.
C: "Overweight" is BMI-for-age ≥ 90th percentile; "obese" is BMI-for-age ≥ 95th percentile.
D: "Overweight" is BMI-for-age ≥ 85th percentile; "obese" is BMI-for-age ≥ 95th percentile.

Obese children have:
- Decreased bone mineral content
- Increased hydration of lean mass
- Decreased total body water
- Increased intracellular water

Q1 Answer: D  Q2 Answer: B

IMPLEMENTATION OF ANTIMICROBIAL STEWARDSHIP PROGRAM AT WHEATON FRANCISCAN ST. JOSEPH HOSPITAL

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Purpose: The inappropriate use of antibiotics has led to numerous health-related concerns including emergence of resistant bacteria, increased number of adverse effects, and increased costs. Appropriate selection of antibiotics coupled with timely administration can have a large impact on patient outcomes and pharmacy costs. This antibiotic stewardship program (ASP) is to ultimately create a business proposal for a new pharmacist FTE. This ASP is secondary to a former residents program, which evaluated whether St. Joseph Hospital (SJH) could implement an ASP utilizing current staff and resources. The results showed that a program was not feasible.

Objective: develop a business proposal for a new pharmacist position with a focus in infectious disease and create a sustainable ASP to reduce pharmacy antibiotic costs and limit the emergence of resistant bacteria.

Methods: Adults admitted to SJH between February 28, 2011 and March 21, 2011 in the ICU or non-ICU setting with treatable infections other than endocarditis, meningitis, cystic fibrosis, and neutropenic fever will be monitored based on established ASP policies and procedures. These will include empiric order sets, pharmacist procedure algorithm, de-escalation policy, and an IV to PO policy. Following the pilot, data will be gathered in order to analyze pharmacist adherence to protocols, antibiotic use costs, and readmission rates. These analyses will be used to generate a business proposal for a new pharmacist position.

Preliminary Data: Data from the previous resident project showed that it would take 9 minutes per pharmacist shift to monitor only 2 antibiotics. Extrapolated data showed that it was not feasible to establish an antimicrobial stewardship program with the current staff and resources. Recent data gathered by an infectious disease physician in the ICU who currently streamlines antibiotic use, showed a cost savings of almost $6,000 over a four-month period.

Learning Objectives:
- Describe the benefits of an antimicrobial stewardship program for the pharmacy and hospital system.
- Identify documents necessary to create a business proposal and an antimicrobial stewardship program.

Self Assessment Questions:
Which of the following is (are) a benefit of an antimicrobial stewardship program?

A: Decreased emergence of resistant bacteria
B: Reduced antibiotic use costs
C: Reduced antibiotic related adverse events
D: All of the above

Which of the following is a TRUE statement?

A: The use of empiric order sets, IV to PO policies, and de-escalation policy, and an IV to PO policy will reduce antibiotic use costs, and readmission rates. These analyses will be used to generate a business proposal for a new pharmacist position.

Q1 Answer: D  Q2 Answer: B

ACPE Universal Activity Number 121-999-11-263-L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
EVALUATION OF VANCOMYCIN AS INITIAL THERAPY IN FEBRILE NEUTROPENIC HEMATOLOGY AND ONCOLOGY PATIENTS

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Purpose: Febrile neutropenia is the most common complication of myelosuppressive chemotherapies. Febrile neutropenia is defined as a single oral temperature ≥ 38.3°C or temperature ≥ 38.0°C for over an hour, with an absolute neutrophil count (ANC) < 500/mcL or < 1000/mcL with a predicted decrease to < 500/mcL over the next 48 hours. Current National Comprehensive Cancer Network (NCCN) febrile neutropenia guidelines recommend against the use of widespread vancomycin utilization due to possible breakthrough infections with vancomycin-resistant organisms. The NCCN guidelines specify indications in which it is appropriate to initiate vancomycin as part of the initial regimen. The purpose of this study is to compare the success rate of febrile neutropenic hematology and oncology patients who receive initial vancomycin for the resolution of empiric methicillin-resistant Staphylococcus aureus (MRSA) infection to those who do not receive initial vancomycin per NCCN guidelines. Secondary objectives are to compare vancomycin use based on patient characteristics stratified by the Hematopoietic Cell Transplantation Comorbidity Index (HCTCI), and determine incidence of resistant gram-positive organisms within our study population.

Methods: This study was a single center, retrospective, cohort analysis including adult hematologic and oncologic patients treated for febrile neutropenia between June 1, 2008 to November 1, 2010. Patients transferred from outside hospitals or with a vancomycin allergy will be excluded. Patients will be classified as receiving appropriate or inappropriate febrile neutropenia treatment with or without vancomycin per NCCN guidelines. To assess initial treatment success, four criteria must be met by day 4 of treatment: resolution of fever, no changes in radiographic evidence and microbiological data, and no antimicrobial escalation. The primary objective and secondary objective of incidence of resistant gram-positive organisms will be analyzed by chi-squared test. Patient characteristics stratified using HCTCI will be analyzed by multivariate analysis.

Results/Conclusions: Pending data collection and analysis.

Learning Objectives:
Review the most recent NCCN guidelines regarding vancomycin as initial use in febrile neutropenic hematology and oncology patients. Define febrile neutropenia.

Self Assessment Questions:
Which of the following is an indication for vancomycin use as part of initial therapy for febrile neutropenia?
A: History of cultures positive for gram-positive organisms
B: History of cultures positive for gram-negative organisms
C: Risk factors for viridans group streptococcal bacteremia
D: Prophylaxis with cephalosporins

Febrile neutropenia is defined as:
A: Single oral temperature ≥ 38.0°C or temperature ≥ 37.0°C for over an hour
B: Single oral temperature ≥ 38.3°C or temperature ≥ 38.0°C for over an hour
C: Single oral temperature ≥ 38.0°C or temperature ≥ 37.0°C for over an hour
D: Single oral temperature ≥ 38.3°C or temperature ≥ 38.0°C for over an hour

Q1 Answer: C  Q2 Answer: B

ACPE Universal Activity Number 121-999-11-130-L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
OPTIMIZING EMPIRIC THERAPY FOR URINARY TRACT INFECTIONS IN THE EMERGENCY DEPARTMENT
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Purpose:
Urinary tract infection (UTI) is a common presenting illness at most emergency departments. Patients present from many different locations including the community, other inpatient hospitals, rehabilitation facilities, nursing homes, and long-term care facilities. As the causative microbiology in UTIs in these settings can greatly vary, it is imperative to develop strategies to optimize empiric therapy in order to improve patient outcomes as well prevent the development of drug-resistant organisms. A related problem at many institutions is the overtreatment of asymptomatic bacteriuria. Inappropriate treatment also promotes the development of drug-resistant organisms. It is therefore important to determine the frequency of and patient characteristics associated with inappropriate treatment in order to implement strategies for education.

Methods:
This is an Institutional Review Board-approved retrospective study from August 2010 to January 2011. Theradoc was accessed daily and new positive urine cultures obtained within 48 hours of hospitalization were analyzed after patient discharge. Patients greater than 3 years of age with a positive bacterial urine culture within 48 hours of hospitalization were included in this study. Duplicate patients as well as positive fungal urine cultures were excluded. The electronic medical record was accessed to obtain the following information: patient demographics, presenting location, comorbidities, signs and symptoms of UTI, antibiotic regimen, and antimicrobial susceptibility. This data will be analyzed in order to determine the most appropriate empiric antibiotic therapy for patients presenting from differing locations as well determine the frequency and patient characteristics associated with the inappropriate treatment of asymptomatic bacteriuria.

Results:
Results and conclusions are currently in progress and will be presented at the Great Lakes Residency Conference.

Learning Objectives:
Identify variant causative microbiology of UTIs based on patient presenting location and translate susceptibility data into appropriate empiric UTI regimens.
Recognize the frequency of and patient characteristics associated with the inappropriate treatment of asymptomatic bacteriuria.

Self Assessment Questions:
Which of the following factors are associated with the development of a drug resistant organism?
A: Recent hospitalization (within 90 days)
B: Community residence
C: Residence in a nursing home
D: A and C

Which of the following patient populations should appropriately be treated for asymptomatic bacteriuria?
A: Pregnant patients
B: Patients with recent antibiotic use (within 90 days)
C: Chronic hemodialysis patients
D: Patients residing in a nursing home

Q1 Answer: D  Q2 Answer: A

THE TOLERABILITY AND REGIMEN COST OF TUMOR NECROSIS FACTOR-ALPHA INHIBITORS FOR THE TREATMENT OF CROHNS DISEASE IN PEDIATRIC PATIENTS
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Purpose: The purpose of this study is to evaluate the tolerability and regimen cost of tumor necrosis factor alpha inhibitors (infliximab, adalimumab, certolizumab) in the treatment of pediatric patients with Crohn's disease.

Methods: This is an open-label, prospective, monitoring study which will be completed at Children's Hospital of Wisconsin clinics in Wauwatosa, WI. All pediatric patients with Crohn's disease who are receiving treatment with infliximab, adalimumab, or certolizumab at the Children's Hospital of Wisconsin clinics from December 1st, 2010 until March 1st, 2011 will be included in this study. A patient/parent questionnaire was developed in order to determine the incidence of adverse reactions. At each clinic appointment, patients are questioned in order to determine the occurrence of adverse reactions to TNF-α inhibitors since last treatment. Additionally, during each visit patients are monitored for any injection or infusion-related reactions and treatments for infusion/injection-related reactions will be documented. The data collected includes patient demographics, dose and frequency of TNF-α inhibitor, pre-medications, number and characteristics of adverse reactions since last visit, and adverse reactions immediately following administration. The regimen cost will be calculated for each clinic appointment in order to complete a pharmaco-economic cost analysis of these agents following completion of this study.

Preliminary results: Data collection is ongoing. Preliminary data includes 31 infliximab patients, four certolizumab patients, and no adalimumab patients thus far. Of the 31 infliximab patients, 20 patients reported 53 side effects since the time of last infusion and two patients had adverse reactions during the infusion. Of the four certolizumab patients, two reported side effects of abdominal pain since last injection and no patients had adverse reactions after injection.

Conclusions: Conclusions will be based on the tolerability of infliximab, adalimumab, or certolizumab and estimated cost of each therapy following completion of data collection.

Learning Objectives:
Discuss the potential side effect and cost advantages of infliximab, adalimumab and certolizumab for the treatment of pediatric patients with Crohn's disease.
Describe the administration and pediatric dosing of infliximab, adalimumab and certolizumab for the treatment of pediatric patients with Crohn's disease.

Self Assessment Questions:
Which of the following is/are given by subcutaneous injection?
A: Adalimumab and infliximab
B: Certolizumab and infliximab
C: Adalimumab and certolizumab
D: Infliximab

Which of the following is a benefit of infliximab over certolizumab or adalimumab for pediatric patients with Crohn's disease?
A: Shorter administration time
B: Lower incidence of adverse reactions
C: FDA approved indication
D: Lower cost

Q1 Answer: C  Q2 Answer: C

ACPE Universal Activity Number 121-999-11-213 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
DISCHARGE MEDICATION COUNSELING BY A PHARMACIST IN THE EMERGENCY DEPARTMENT

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Discharge medication counseling has been shown to decrease the frequency of readmissions and to improve patient safety upon discharge from the hospital. The effect of medication counseling by pharmacists upon discharge from the emergency department has not been studied. Pharmacists can play a key role in patient education upon discharge to improve patient comprehension and safety of medication use. The purpose of this study is to pilot and implement a pharmacist conducted discharge medication counseling service in the emergency department.

This study has been submitted to the Institutional Review Board for approval. The pilot will target patients being discharged home from the emergency department with new prescriptions for anti infective medications. Pre intervention and intervention study periods will be conducted. During the pre intervention study period a pharmacist will conduct follow up interviews via telephone with patients that were prescribed an anti infective medication with usual care upon discharge. Usual care currently includes a brief explanation of discharge and medication instructions by a registered nurse. The intervention study period will include patients identified before discharge that are receiving a prescription for anti infective medications. These patients will be counseled on their new medications by a pharmacist before discharge and contacted for a follow up interview after discharge via a telephone call. Follow up telephone interviews will assess adherence, comprehension, and satisfaction. Outcomes will include patient comprehension as well as adherence to the prescribed medication regimen and patient satisfaction with discharge medication instructions. Secondary outcomes will include identification of pharmacy where discharge prescriptions were filled and visits to the emergency department within 30 days.

Results will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Review previous select studies showing benefit of pharmacist conducte discharge medication instruction.

Describe the challenges to pharmacist conducted discharge medication counseling in the Emergency Department.

Self Assessment Questions:
Which of the following benefits of pharmacist conducted medication counseling has been demonstrated in previous studies?
A. Improved patient understanding of overall medication regimen
B. Improved patient adherence to newly prescribed medication
C. Decrease in prescription filling rates after discharge
D. Increased patient satisfaction with overall hospital visit

What is the greatest challenge of pharmacist conducted discharge medication counseling in the Emergency Department?
A. Limited pharmacist time to dedicate to counseling
B. Nursing staff unwillingness to allow pharmacist counseling
C. Increase in length of stay for patients, therefore delaying patient tu
D. Patient unwillingness to listen to medication instruction

Q1 Answer: B  Q2 Answer: A

ACPE Universal Activity Number  121-999-11-328 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5

IMPLEMENTATION OF AN OUTPATIENT ORAL CHEMOTHERAPY MONITORING PROGRAM

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Purpose:
The purpose of this project is to design and implement an outpatient monitoring program for oral chemotherapy agents. An analysis will assess the impact on patient adherence to medication refills and laboratory monitoring compared to a sample of retrospective patients.

Methods:
Prior to implementation of the monitoring program, the computerized patient record system will be used to perform a retrospective analysis of patient charts to identify patients who received capetecabine, erlotinib, everolimus, imatinib, lenalidomide, sorafenib, sunitinib, temozolomide, thalidomide as an outpatient between August 2009 and August 2010. A randomized selection of 50 patients will be included in the analysis. The selected patient charts will be reviewed for on-time refills, documentation of side effects, appropriate laboratory monitoring, and whether action was taken for out of range lab values.

A monitoring regimen will be assigned to each of the selected oral chemotherapy agents. Regimens will include date ranges in which patients should be contacted for telephone calls or clinic visits, laboratory draws, or side effect management. Microsoft Access will be used to manage patient-specific schedules. Monitoring will be accomplished through pharmacist telephone calls or clinic appointments intended to provide consultation on appropriate refill frequency, medication administration, laboratory monitoring appointments, and side effect management. Patients will be enrolled in the study once a prescription has been written for one of the selected medications. The first 50 patients to be enrolled will be included in the prospective analysis. Data will be collected as telephone calls or appointments and will be documented in the Microsoft Access database and the computerized patient record system. The data will be analyzed on an ongoing basis to assess the impact of pharmacist monitoring on adherence, side effect management, and laboratory monitoring.

Results: Results and conclusions to be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Recognize the issue of noncompliance with oral chemotherapy medications and the importance for interventions to improve compliance. Identify interventions that have been shown to improve patient compliance to oral chemotherapy agents.

Self Assessment Questions:
A review performed to study compliance of adults to oral chemotherapy agents found that patient self-reports had a rate of ___ for frequent or occasional nonadherence.
A. 10-16%
B. 22-30%
C. 44-48%
D. 53-61%

Providing interventions such as education, home psychological support and restructuring, or training in pill taking was found to increase patient adherence to oral chemotherapy agents by how much?
A. 10-16%
B. 22-30%
C. 44-48%
D. 53-61%

Q1 Answer: D  Q2 Answer: C

ACPE Universal Activity Number  121-999-11-463 -L05-P
Activity Type: Knowledge-based Contact Hours: 0.5
**Epidemiology, Risk Factors, and Outcomes of Fluconazole Sensitive Versus Non-Fluconazole Sensitive Candidemia**

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**Purpose:**
Candida species are the most common fungal pathogens and rank as the fourth leading cause of nosocomial bloodstream infections. Increased antibiotic usage, numbers of immunocompromised patients, and frequency of invasive procedures have all contributed to the prevalence of Candida infections. Microbiological surveillance data has also revealed a changing epidemiology and the emergence of non-albicans and azole resistant Candida species. The effects on clinical outcome of these shifts in species distribution and susceptibility have yet to be determined. The objectives of this study are to determine the following: incidence of fluconazole sensitive and non-fluconazole sensitive candidemias, risk factors for non-fluconazole sensitive candidemias, and effect of non-fluconazole sensitivity on patient outcomes.

**Learning Objectives:**
- Describe fluconazole sensitive and fluconazole non-sensitive Candida species.
- Discuss epidemiology of Candida species causing nosocomial bloodstream infections.

**Self Assessment Questions:**
Which Candida species are most likely to be fluconazole non-sensitive?
- A: *C. tropicalis* and *C. glabrata*
- B: *C. parapsilosis* and *C. tropicalis*
- C: *C. krusei* and *C. albicans*
- D: *C. glabrata* and *C. krusei*

Which Candida species have increased and decreased in relative prevalence as causes of candidemia in the last decade, respectively?
- A: *C. tropicalis* and *C. albicans*
- B: *C. krusei* and *C. glabrata*
- C: *C. glabrata* and *C. albicans*
- D: *C. albicans* and *C. parapsilosis*

Q1 Answer: D  Q2 Answer: C

**Comparing Efficacy of Metronidazole and Vancomycin Dosage Regimens in the Treatment of Clostridium Difficile Infection**

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**Purpose:** Metronidazole and oral vancomycin are first line treatment regimens utilized for Clostridium difficile infections (CDI). Only three randomized controlled trials limited by small sample sizes and differing endpoints compare the use of these agents in CDI. The most recent study found vancomycin to be superior in patients classified with severe CDI, and led to the 2010 Infectious Diseases Society of America and Society for Healthcare Epidemiology of America (IDSA/SHEA) guideline adopting severity as a determinant in selecting initial therapy for CDI. This trial was the first to show a difference in outcomes, although controversy remains surrounding the classification of severity and definition of cure, as well as the dose of metronidazole. Another area of debate relates to dosing of oral vancomycin for CDI. The purpose of this study is to evaluate outcomes associated with various dosage regimens comparing metronidazole versus oral vancomycin.

**Methods:** Retrospective, observational study of adult patients (≥18 years) with a positive Clostridium difficile toxin assay between July 1, 2009 and December 31, 2010 identified via the microbiology laboratory database. Exclusion criteria include patients admitted on therapy for CDI, treatment with metronidazole or oral vancomycin during the 14 days prior to initiation of therapy for CDI, and recurrent infection occurring within eight weeks of resolution of prior episode of CDI. Data collected will include baseline demographics, hospital and intensive care unit (ICU) length of stay (LOS), medication regimen, resolution of symptoms recurrence of infection, mortality, and pertinent lab and vital sign values. The primary outcome will be time to resolution of symptoms, with secondary outcomes including clinical cure, relapse rate, ICU and hospital LOS, and mortality.

**Results:** Data collection and evaluation are ongoing and will be presented at the Great Lakes Pharmacy Resident Conference

**Learning Objectives:**
- Describe the epidemiology, pathophysiology, and risk factors of Clostridium difficile infection (CDI).
- Discuss literature and IDSA/SHEA Guidelines for CDI in adults.

**Self Assessment Questions:**
Which of the following is a risk factor for the development of CDI?
- A: Age >50
- B: Recent antimicrobial usage
- C: Recent stool softener usage
- D: Temperature > 38°C

According to the IDSA/SHEA 2010 guidelines, what would be the recommended therapy for an initial episode of severe CDI?
- A: Metronidazole 500 mg po tid
- B: Rifaximin 200 mg po bid
- C: Vancomycin 125 mg po qid
- D: Vancomycin 500 mg po qid

Q1 Answer: B  Q2 Answer: C

**ACPE Universal Activity Number** 121-999-11-078 -L01-P

**Activity Type:** Knowledge-based  **Contact Hours:** 0.5
IMPLEMENTATION OF A RISK EVALUATION AND MITIGATION STRATEGY (REMS) PROGRAM FOR ERYTHROPOIETIN STIMULATING AGENTS

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Purpose:
The purpose of this project is to implement a system for complying with a risk evaluation and mitigation strategy (REMS) program for erythropoietin-stimulating agents (ESAs) and to assess the impact of a REMS program on a health system.

Methods:
A literature review was conducted to assess existing systems for complying with REMS programs, including those with specific criteria for managing ESAs. An implementation plan, including tactics for implementation across the health system, was developed by an interdisciplinary workgroup. A reporting system was developed to track compliance with program criteria and to facilitate system improvement through continuous modifications. Compliance with REMS program requirements will be evaluated by a retrospective chart audit after implementation. Time devoted to training and educating providers impacted by program will be measured by self-report. An assessment of the economic impact of REMS program implementation and management on the health system will be estimated by measuring accrued time and associated costs. System development was documented to establish a framework for efficient implementation of future REMS programs. This project has been submitted to the University of Wisconsin-Madison Health Sciences Institutional Review Board (IRB) for exemption.

Results:
Results will be presented at the Great Lakes Pharmacy Residency Conference.

Conclusions:
Conclusions will be presented at the Great Lakes Pharmacy Residency Conference

Learning Objectives:
Discuss the purpose of a risk evaluation and mitigation (REMS) strategy program.
Review the criteria for erythropoietin-stimulating agents risk evaluation and mitigation strategy (REMS) program.

Self Assessment Questions:
The FDAs main objective for adding a risk evaluation and mitigation strategy (REMS) program for erythropoietin-stimulating agents (ESAs) and to assess the impact of a REMS program on a health system.

Manufacturer auditing for compliance with the APPRISE oncology program will consist of:
A Proper use of erythropoietin-stimulating agents in breast, non-smma
B Prescriber training and signed acknowledgement form
C Fines for non-compliance
D Documentation of distribution of medication guides

Q1 Answer: A Q2 Answer: B

ACPE Universal Activity Number 121-999-11-245 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
Background:
Smoking cigarettes causes 1 in 5 deaths in the U.S. yearly. Although the Centers for Disease Control (CDC) states 47 million people have successfully quit smoking, 46 million smokers remain. While 70% of current smokers want to quit, barriers often prevail. Developing programs to help patients successfully quit will result in health improvement and a better quality of life for the smokers and those around them.

Purpose:
This pilot program was initiated with a goal to design a smoking cessation program based upon current evidence to aid in the success of employees attempting to quit. The program was created in an effort to increase pharmacy-based ambulatory care services within Wellspring Pharmacy and Community Health Network.

Methods:
The need for a smoking cessation program was assessed through insurance incentive wellness screenings. The program was created and implemented based on current practice guidelines. Methods proven to increase the success rate of smoking cessation were incorporated and include: intensive interventions on an individual basis, within a supportive group, and over telephone, behavioral therapy, and encouragement to use approved medications.

The program was initiated during the month of January to capture patients resolving to quit in the New Year. The first meeting was an individual meeting with a pharmacist. Group meetings were held weekly thereafter for 5 consecutive weeks. The employees each set a quit date the week after the second group meeting. Topics discussed at the last three group meetings included dealing with slip-ups, stress, and weight gain.

The group meetings were followed by another individual meeting, where certificates of completion were awarded. A follow-up survey was also completed during this time. Patients were telephoned for up to two months after the follow-up to provide continued encouragement.

Results:
Results and conclusions to be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
List factors of a smoking cessation program that increase the success of the patients to quit.
Define the difference between various counseling and behavior therapies related to smoking cessation.

Self Assessment Questions:
Which of the following statements is TRUE?
A: Group intervention for smoking cessation is recommended over in
B: Self-help programs are as effective as person-to-person interven
tic
C: Acupuncture has shown evidence to aid in smoking cessation vers
D: The greater number of formats in program (group intervention, in
Smoking cessation programs have a better success rate when combining practical counseling and encouragement/behavioral therapy. What is an example of practical counseling?
A: Communicating belief in patient’s ability to quit
B: Teaching patients to anticipate and avoid temptation and trigger si
C: Asking about the patient’s fears and ambivalence regarding quittin
D: Teaching patients how positive thoughts about quitting smoking ca

Q1 Answer: B  Q2 Answer: D

ACPE Universal Activity Number 121-999-11-441 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5
SAFETY EVALUATION OF MEDICATION ORDERS IN THE EMERGENCY DEPARTMENT
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Emergency rooms are high paced departments that see a multitude of patients every year. The volume of patients necessitates the need to provide efficient and effective patient care. These high stress work environments and the diversity of patients seen in the emergency departments (ED) creates the potential for medication errors to occur. Due to the often critical nature of patients seen, these errors carry a high degree of risk. With more than three fourths of all ED visits receiving medication therapy, there is potential for numerous and possibly dangerous medication errors to occur. Studies have shown that pharmacists working in the ED reduce the incidence of potential adverse drug events caused by medication error. Pharmacist intervention in medication decision-making prior to orders being written can potentially reduce the incidence and risk of medication errors in the ED.

The objective of this study is to assess the safety of medication orders in the ED and identify potential and actual medication risks. A retrospective chart review was conducted looking at medication orders for 250 patients seen in the emergency department at Rush University Medical Center over calendar year 2010. A data collection tool was created in order to assess the number of medication orders in the ED, medication reconciliation in the ED, adherence to national and institution specific guidelines, administration of medications prior to pharmacist verification, and the number and type of medication errors that occur. Errors with high risk medications, national patient safety goals, and the institute of safe medication practices were also evaluated. Results will be tallied and analyzed to try and identify medication errors that occur in the ED, and where pharmacy intervention can potentially reduce error and provide safe and effective medication therapy.

Learning Objectives:
Recognize common types of medication errors that occur in the emergency department. Identify how pharmacist intervention in the emergency department can help ensure safe and effective medication therapy.

Self Assessment Questions:
Which of the following statements is true?
A: Because of the limited time that patients stay in the emergency department, medication errors are more likely to occur.
B: Pharmacist intervention in the emergency department has been shown to reduce medication errors.
C: Medication errors infrequently occur in the emergency department.
D: Pharmacy intervention in the emergency department does not provide a reduction in medication errors.

Which of the following increases the risk of medication errors in the emergency department?
A: Evenly paced workflow
B: Low acuity admissions
C: Short stay within the emergency department
D: Diversity of patients seen

Q1 Answer: B Q2 Answer: D

ACPE Universal Activity Number 121-999-11-496 -L05-P
Activity Type: Knowledge-based Contact Hours: 0.5

IMPLEMENTATION OF A DARBEPOETIN ALFA AND IRON SUPPLEMENTATION MONITORING PROGRAM
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Purpose:
A lack of response to erythropoiesis-stimulating agents has been attributed to iron deficiency. Laboratory monitoring of iron status before and during treatment as well as supplemental iron to correct for iron deficiency is recommended by the KDOQI Clinical Practice Guidelines and the American Society of Hematology and American Society of Clinical Oncology clinical practice guidelines. The objective of this study is to assess the appropriateness and effectiveness of darbepeotin alfa and iron supplementation before and after the initiation of a Pharmacist lead monitoring program.

Methods:
All patients 18 to 90 years old receiving at least one dose of darbepeotin alfa between June 1, 2010 and August 31, 2010 at Mercy St. Charles hospital and outpatient infusion center before implementation of the monitoring program were included in a retrospective chart review. Those receiving at least one dose of darbepeotin alfa between February 1, 2011 and April 1, 2011 were included in the prospective review during implementation of the monitoring program. The program consists of monitoring serum ferritin, transferrin saturation, hemoglobin, hematocrit, and darbepeotin alfa dose with recommendations made to physicians regarding intravenous iron supplementation if serum ferritin is <100ng/mL and transferrin saturation <20%. The data collected will be analyzed to determine the percentage of patients with appropriate hemoglobin, serum ferritin, and transferrin saturation monitoring, change in hemoglobin, and appropriate supplementation of iron before and after implementation of the monitoring program. The data will also be reviewed for adverse events related to the supplementation of iron.

Results/Conclusions:
Data collection and analysis currently in progress and will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Describe current guidelines for iron supplementation with darbepeotin alfa in chronic kidney disease and chemotherapy-induced anemia. Recognize the key components of a darbepeotin alfa and iron supplementation monitoring program.

Self Assessment Questions:
Intravenous iron supplementation is indicated in which of the following?
A: Hemodialysis patient receiving darbepeotin alfa with a serum ferritin level <50ng/mL
B: A chemotherapy patient receiving darbepeotin alfa with a serum ferritin level between 50-150ng/mL
C: Hemodialysis patient receiving darbepeotin alfa with a serum ferritin level >150ng/mL
D: Answers A & B

Which of the following is appropriate to monitor in a darbepeotin alfa and iron supplementation monitoring program?
A: Hemoglobin monthly in a patient just started on darbepeotin alfa
B: Serum ferritin level before every dose of darbepeotin alfa
C: Transferrin saturation before every dose of darbepeotin alfa
D: Hemoglobin weekly before darbepeotin alfa dose in a patient just started on darbepeotin alfa

Q1 Answer: C Q2 Answer: D

ACPE Universal Activity Number 121-999-11-074 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
Purpose
Candidemia is the fourth most common cause of nosocomial bloodstream infections and is associated with mortality rates as high as 47%. Significant variability among Candida species has been demonstrated between hospitals and intensive care units with surveillance data indicating a rise in non-albicans Candida infections. Recent literature suggests that inappropriate and delayed antifungal therapy is associated with prolonged hospitalization, increased healthcare costs and higher mortality. The objective of the study was to characterize the relationship between the timing of empiric antifungal therapy and patient outcomes, and also identify risk factors for Candida spp. bloodstream infections at Detroit Receiving Hospital.

Methods
This retrospective, observational study included patients with positive Candida blood cultures. Patients were excluded if less than 18 years of age or neutropenic due to recent chemotherapy. Baseline demographics, past medical history and culture results were collected or all enrolled patients. Time to appropriate antifungal therapy was defined as the time from the first blood sample positive for Candida species to the administration of appropriate antifungal therapy. Appropriate therapy was defined as the administration of an antifungal agent with in vitro activity against the Candida species causing the infection. However, susceptibility testing was not available for all patients. Severity of illness scores (APACHE II and SOFA scores) within 24 hours of ICU admission were collected for review. Additionally, the use of intravascular catheters, total parenteral nutrition, previous antimicrobial exposure and corticosteroid therapy was collected for identification of institution specific risk factors for candidemia. Study outcomes included: hospital and ICU length of stay, overall mortality and discharge disposition were recorded.

Results and Conclusions
Results and study conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:
Discuss the prevalence and risk factors of candidemia.
Describe the relationship between the timing of appropriate antifungal therapy and patient outcomes.

Self Assessment Questions:
Which of the following is a risk factor for developing candidemia?
A Use of peripheral IV catheters
B Use of enteral nutrition
C Use of broad-spectrum antibiotics
D Endotracheal intubation
Which of the following best describes the relationship between mortality and the timing of appropriate antifungal therapy?
A Delays in appropriate antifungal therapy have been associated with
B Delays in appropriate antifungal therapy have been associated with
C There is no relationship between the timing of appropriate antifungal therapy
D The relationship between timing of appropriate antifungal therapy
Q1 Answer: C Q2 Answer: A

ACPE Universal Activity Number 121-999-11-244-L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

D: Endotracheal intubation
C: Paroxysmal nocturnal dyspnea
B: Pulmonary edema
A: Discontinuation or reduction of diuretic therapy
Which of the following is a possible adverse effect of diuretic dose escalation in the setting symptomatic heart failure?
A Worsening renal function
B: Pulmonary edema
C: Paroxysmal nocturnal dyspnea
D: Peripheral edema

Which of the following is a possible adverse effect of diuretic dose escalation in the setting symptomatic heart failure?
A Discontinuation or reduction of diuretic therapy
B Discontinuation or reduction of angiotensin-converting enzyme inh
C Hospital admission
D All of the above
Q1 Answer: A Q2 Answer: D

ACPE Universal Activity Number 121-999-11-241-L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

ACPE Universal Activity Number 121-999-11-244-L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
PATIENT OUTCOMES AND SATISFACTION WITH A PHARMACIST-MANAGED ANTICOAGULATION CLINIC IN A VETERANS AFFAIRS MEDICAL CENTER
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PURPOSE:
The purpose of this study is to evaluate the effect of a pharmacist-managed warfarin clinic on anticoagulation management in a VA population. The primary outcome is the percentage of therapeutic, subtherapeutic, and supra-therapeutic INRs before and after transition from primary care. Secondary outcomes are the incidence of hemorrhagic and thrombotic events and hospital admissions secondary to anticoagulation therapy. Patients included in the review were also asked to complete a voluntary survey to assess satisfaction in the quality of care and services provided by the pharmacy warfarin clinic.

METHODS:
A retrospective chart review was conducted on warfarin patients who were followed by their primary care provider and then transitioned to the pharmacy warfarin clinic. Inclusion criteria: patients transferred from primary care to the pharmacy warfarin clinic for anticoagulation management between January 1, 2010 and June 30, 2010. Exclusion criteria: patients followed less than three months by their primary care provider prior to transition and patients with only one or no INR value before or after transition. For the survey, patients were excluded if they were not enrolled in the warfarin clinic at the time of the survey or if they are managed via phone visits.

From each patients electronic chart, information was recorded using a standardized data collection form. From the INR values obtained, the amount of therapeutic, sub-therapeutic and supra-therapeutic values were recorded based on the patients individual goal INR range, along with the reason for a non-therapeutic reading. Percentages were calculated from the total number of INRs. Descriptive statistical analyses will be used to evaluate the data collected. Nominal data will be evaluated using McNemars non-parametric test of paired samples. Continuous data will be evaluated using a paired t-test.

CONCLUSIONS: Pending at time of submission.

Learning Objectives:
Discuss the benefits of anticoagulation clinics on patient outcomes as compared to traditional INR monitoring.

Identify the effectiveness of pharmacists in the management of anticoagulation therapy.

Self Assessment Questions:
Which of the following results in the most stable anticoagulation therapy and improved patient outcomes?

A: Traditional INR monitoring by primary care
B: Monitoring INR every four to six weeks
C: Anticoagulation clinic INR monitoring
D: Inpatient INR monitoring

Pharmacist-managed anticoagulation clinics are shown to result in:

A: Increased number of hospital admissions
B: Increased number of therapeutic INRs
C: Increased number of thrombotic events
D: Increased number of non-therapeutic INRs

Q1 Answer: C  Q2 Answer: B

ACPE Universal Activity Number  121-999-11-284 -L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5

THE EFFECT OF TNF-ALPHA ANTAGONISTS ON ANTI-DIABETIC MEDICATION AND HEMOGLOBIN A1C
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Background:
Type 2 Diabetes Mellitus (T2DM) impairs glucose tolerance, insulin secretion, and can increase insulin resistance. T2DM is a combination of both insufficient insulin production and resistance of peripheral receptors to insulin. The main glucose transport mechanism into the cell is GLUT-4, a key cellular and cytoplasmic component that controls the movement of glucose across the cellular membrane and regulates the body's response to insulin. Patients with chronic inflammatory disease states have been shown to have an increased incidence of insulin resistance as evidenced by increased levels of inflammatory mediators such as C-reactive protein, erythrocyte sedimentation rate, and tumor necrosis factor alpha (TNF-alpha).

In most cases of chronic hyperglycemia TNF-alpha production is increased. This directs transient alterations in insulin resistance in times of acute inflammation by decreasing tyrosine kinase activity on the insulin receptor, which impedes insulin-glucose mediated uptake in skeletal muscle, thus increasing insulin resistance.

Purpose:
Evaluate if TNF-alpha antagonists affect Hemoglobin A1c and/or anti-diabetic medication in patients who have Type 2 Diabetes and who are concurrently being treated with a TNF-alpha antagonist.

Methods:
This investigator-initiated, single-center, retrospective study will be conducted at UC Health Clinics associated with University Hospital in Cincinnati, Ohio. Patients with an ICD9 code of T2DM, who meet American Diabetes Association (ADA) diagnosis of the disease, and who concurrently received treatment with TNF-alpha antagonist therapy including etanercept, infliximab, adalimumab, golimumab, and certolizumab pegol will be included. Patients HbA1c and anti-diabetic medication regimen will be evaluated at the earliest recorded time prior to initiation of TNF-alpha antagonist treatment and at a minimum of 24 weeks after initiation. Data collection will include patient demographics including age, sex, weight, height, BMI, anti-diabetic medication, compliance, diet, HbA1c, other co-morbid conditions, and type of TNF-alpha antagonist agent.

Results:
Results and conclusions to be presented at the Great Lakes Residency Conference.

Learning Objectives:
Explain relationship between TNF-alpha antagonism and insulin resistance.

Identify if initiation of a TNF-alpha antagonist effects anti-diabetic medications or Hemoglobin A1c in patients with Type 2 Diabetes being concurrently treated with a TNF-alpha antagonist.

Self Assessment Questions:
Inflammation in Type 2 Diabetes involves what inflammatory pathway?

A: The innate complimentary system
B: The adaptive complimentary system
C: A combination of the innate and adaptive compliments systems
D: A combination of the innate and the extrinsic compliment systems

Which process of TNF-alpha inhibition involving the GLUT-4 insulin receptor is correct?

A: TNF-alpha causes reduced insulin-induced tyrosine phosphorylation
B: TNF-alpha induces the phosphorylation of insulin receptor substrate
C: TNF-alpha causes reduced insulin-induced tyrosine phosphorylation
D: TNF-alpha causes increased phosphorylation of insulin receptor

Q1 Answer: C  Q2 Answer: A

ACPE Universal Activity Number  121-999-11-331-L01-P
Activity Type: Knowledge-based  Contact Hours: 0.5
USE OF APREPITANT FOR THE PREVENTION OF NAUSEA AND VOMITING DURING HIGH DOSE CHEMOTHERAPY
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Background: Aprepitant is a highly selective neurokinin-1 antagonist approved for the prevention of nausea and vomiting in highly and moderately emetogenic chemotherapy. It has limited research in bone marrow transplant (BMT), and the American Society of Clinical Oncology (ASCO) guidelines provide no recommendation of its use in BMT. Several small studies used aprepitant on all days of chemotherapy and have shown promising results without increased adverse events. One small study showed a complete response, defined as no nausea or vomiting without the use of rescue medications, during chemotherapy in 73% of patients in the aprepitant group and 22.5% in the placebo group (p<0.001). Aprepitant was added to the BMT nausea and vomiting protocol at Cleveland Clinic in April 2010. However, it was only added to what was deemed the most highly emetogenic days in an effort to maintain effectiveness while reducing costs. This research seeks to compare nausea and vomiting in patients before and after addition of aprepitant to the protocol.

Methodology: A non-interventional, retrospective chart review evaluating BMT patients will be conducted. Inclusion criteria is age >18 years with BMT at Cleveland Clinic between October 2009 and December 2010. The primary endpoint is complete response rate. Patients excluded include those who receive aprepitant off protocol. A total of 128 subjects (64 per group) are needed to detect a minimal 20% difference in complete response rates (e.g. 40% vs. 20%) between treatment and control groups using Fisher Exact tests with statistical power of 80% at one-sided alpha level of 0.05. The control group is patients that were treated before the addition of aprepitant to the protocol in April 2010. The treatment group is patients who received aprepitant according to the protocol that was initiated in April 2010.

Results and Conclusions: Data analysis is not yet completed.

Learning Objectives:
Describe the use of aprepitant in chemotherapy induced nausea and vomiting (CINV).
Explain current emetic prophylaxis used in bone marrow transplant (BMT).

Self Assessment Questions:
1. Which of the following best describes aprepitants use in BMT?
   A: a. There are numerous randomized controlled trials that have vali
   B: b. Several small studies have used aprepitant in BMT and have s
   C: c. Aprepitant was originally FDA approved in BMT patients.
   D: d. All of the above

Which antiemetic(s) is/are appropriate in BMT?
A: Dexamethasone
B: Aprepitant
C: Ondansetron
D: All of the above

Q1 Answer: B Q2 Answer: D

ACPE Universal Activity Number 121-999-11-330-L01-P
Activity Type: Knowledge-based Contact Hours: 0.5

EFAVIRENZ USE IN HIV+ WOMEN OF CHILDBEARING AGE
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Purpose: Efavirenz, a non-nucleoside reverse transcriptase inhibitor (NNRTI) approved by the Food and Drug Administration in 1998, is commonly prescribed in the treatment of human immunodeficiency virus (HIV) infection due to its potency, tolerability and inclusion in the only single pill, once daily regimen. However, efavirenz may not be suitable for women of childbearing age since significant birth defects including anencephaly, cleft palate, and ophthalmic malformation have been demonstrated in animal studies. In response to growing evidence of fetal harm in humans, the FDA reclassified efavirenz from Pregnancy Category C to D in 2005. The World Health Organization (WHO) and the Department of Health and Human Services (DHHS) have released recommendations for the safe use of efavirenz in women of childbearing age. The primary objective of this study is to characterize the use of efavirenz in HIV+ women of childbearing age. Secondary objectives include incidence of pregnancy and fetal outcome and number of new efavirenz prescriptions per year over a 12 year period.

Methods: This retrospective, descriptive chart review included all women of childbearing age (18-50 years) receiving efavirenz as part of their antiretroviral treatment regimen between July 1, 2009 and June 30, 2010. Data collected included: patient demographics, reproductive status, contraceptive use and method, allergies or intolerances to antiretroviral agents, concurrent medications, pregnancy test done prior to and during efavirenz treatment, pregnancy occurrence and fetal outcome, CD4 nadir, HIV genotype, liver function tests, serum creatinine, lipoprotein levels, insurance status, illicit drug use, alcohol use and mental health history. Secondly, the number of new efavirenz prescriptions prescribed per year in HIV+ women of childbearing age was trended over a twelve year period to evaluate prescribing practices over time.

Results/Conclusions: To be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
State the risks associated with efavirenz use during pregnancy.
Describe current recommendations for use of efavirenz in HIV+ women of childbearing age.

Self Assessment Questions:
Which of the following birth defects has been demonstrated in infants exposed to efavirenz in-utero?
A: Down Syndrome
B: Meningomyelocele
C: Gastrochisis
D: Phocomelia

Which of the following baseline assessments should be obtained prior to initiating efavirenz therapy?
A: Fasting lipid panel
B: Viral genotype
C: Pregnancy test
D: Complete blood count

Q1 Answer: B Q2 Answer: C

ACPE Universal Activity Number 121-999-11-359-L02-P
Activity Type: Knowledge-based Contact Hours: 0.5
GUIDELINES FOR THE MANAGEMENT OF HEALTHCARE ASSOCIATED PNEUMONIA: PHYSICIAN PRESCRIBING PRACTICE AND THE ANTIMICROBIAL STEWARDSHIP TEAMS ROLE IN PROMOTING THE GUIDELINES

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Purpose: When it comes to infectious diseases, pneumonia is the leading cause of death in the United States. The American Thoracic Society (ATS) and Infectious Disease Society of America (IDSA) developed guidelines to assist in the management of healthcare-associated pneumonia (HCAP). The HCAP guidelines recommend empiric antimicrobial therapy, address risk factors for potentially drug-resistant diseases, define an appropriate length of therapy and provide additional information to treat HCAP. The antimicrobial stewardship team analyzes the appropriateness of selected antimicrobial therapy and makes recommendations to adjust a therapeutic regimen, when necessary.

Methods: This study was submitted and approved by the Institutional Review Board. The hospital’s computer system will be utilized to identify patients prescribed antibiotics commonly used to treat HCAP. Patients receiving these antibiotics will be screened for HCAP through chart review. To determine the severity of the pneumonia, specific patient data will be collected including demographics, all cultures, comorbidities, organ function, temperature, length of therapy, oxygen requirements, and white blood cell count. Baseline data and empiric therapy will be recorded on day one of antimicrobial therapy. Clinical improvement and antimicrobial therapy will be assessed on day three. The recommendations to the physicians by the antimicrobial stewardship team may include streamlining treatment, searching for other pathogens or complications, consideration to stop antibiotics, or adjusting antibiotic therapy. The primary endpoints will compare the antimicrobial treatments, relative to the HCAP guidelines and evaluate the ability of the antimicrobial stewardship team to promote the guidelines. The secondary endpoint will compare the different empiric antimicrobial therapies with their associated length of therapy, duration of hospitalization, and clinical improvement.

Results and Conclusion: Data collection and analysis currently in progress and will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:
Review the antimicrobial treatments prescribed by the physicians, relative to the HCAP guidelines and evaluate the ability of the antimicrobial stewardship team to promote those guidelines. Relate empiric antimicrobial therapy with the associated length of therapy, duration of hospitalization, and clinical improvement.

Self Assessment Questions:
Which empiric therapy would be appropriate to be prescribed for healthcare associated pneumonia?
A: Vancomycin + tobramycin + piperacillin/tazobactam
B: Amoxicillin + levofloxacin + daptomycin
C: Azithromycin + ceftriaxone + ertapenem
D: Linezolid + doxycycline + cephalexin

Which of the following is a risk factor for multi-drug resistant pathogens causing healthcare associated pneumonia?
A: Current hospitalization of 2 days or more
B: Antimicrobial therapy in the preceding 160 days
C: Immunosuppressive disease and/or therapy
D: Renal insufficiency

Q1 Answer: A  Q2 Answer: C

USE OF A VIRTUAL PATIENT TO PREPARE STUDENT PHARMACISTS AND PHARMACISTS TO CONDUCT DIABETES-SPECIFIC MEDICATION THERAPY MANAGEMENT (MTM)

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Statement of Purpose
The objective of this study is to determine if pharmacists and student pharmacists at the University of Wisconsin School of Pharmacy who complete four online medication therapy management (MTM) encounters with a virtual patient develop the necessary skills and confidence to implement MTM services for patients with diabetes in their current or future practice.

Statement of Methods Used
Project approval was received from the Educational Research Institutional Review Board at the University of Wisconsin. The intervention is an online program that simulates four MTM encounters between a pharmacist and a virtual patient with diabetes. After each interaction, participants will complete documentation as SOAP notes, prioritize drug-related problem lists, patient medication action plans, and updated personal medication records. Participation in the study is projected at 280 individuals. Participants opinions related to MTM and knowledge of diabetes will be measured with surveys and tests related to the three domains of the Theory of Planned Behavior (attitudes, subjective norm, and perceived behavioral control) and the medical care of a patient with diabetes. Survey and test responses pre and post intervention will be compared to determine the effect on participants knowledge of and intent to perform diabetes-focused MTM reviews with patients in their current or future practice.

Preliminary Results to Support Conclusion
Study data will be collected between October, 2010 and April, 2011. Of 132 student participants, 80 consented to allow their responses to be included in the study. No pharmacist data is currently available.

Conclusion
This is an on-going study and no conclusions have been drawn as of January 17, 2011.

Learning Objectives:
Explain the benefits of a virtual patient program compared to a traditional home study CE program.
List common barriers and motivators for pharmacists to perform MTM services.

Self Assessment Questions:
What factor has been reported as the most commonly cited barrier to pharmacists performing MTM services?
A: Staffing does not allow for one-on-one meetings with patients
B: Limited access to patients’ medical information (eg lab results)
C: Absence of collaborative practice agreements
D: Lack of reimbursement for pharmacists time and interventions

Which of the following is a benefit of active learning?  Active learning:
A: Increases contact time between the learner and instructor
B: Ensures knowledge will be applied in the “real world”
C: Requires less preparation time than traditional lectures
D: Increases contact time between the learner and instructor

Q1 Answer: A  Q2 Answer: D
Purpose: Within the inpatient setting, opioids are the medication class with the highest incidence of adverse events at Henry Ford Hospital in Detroit, MI. Due to the high frequency of opioid use, and the reported risk of serious harmful events, it would be useful to determine risk factors for opioid-induced adverse drug reactions. Naloxone use can be a surrogate marker for serious opioid harm. The purpose of this study is to create and validate a risk score to predict the use of naloxone to reverse an opioid-induced adverse drug reaction in the inpatient setting.

Methods: This retrospective, case-control study using Henry Ford Corporate Data Stores and patient chart review will analyze patients receiving opioids over a six month period. We anticipate the ability to select 100 patients to include in the case group. Using a case-control ratio of 1:2, 200 patients will be randomly selected from all patients who received opioids within same period. Risk factors to be analyzed include age, weight, sex, chronic kidney disease/acute renal failure, end stage liver disease/cirrhosis, chronic obstructive pulmonary disease/emphysema, admission to a general practice unit versus an intensive care unit, and opioid naive versus tolerant status. Exclusion criteria include patients less than 18 years of age, patients admitted to surgical units, or patients receiving naloxone in the operating room, emergency room, or post-operative recovery area. A risk score will be created through a multivariate analysis of the significant risk factors identified. Using the same criteria, validation of the risk score will be performed with a new case and control group from a different 6 month period. Data on length of stay and patient disposition will be collected to see if there is association with risk score and these outcomes.

Results and conclusions to be presented at the Great Lakes Residency Conference.

Learning Objectives:
Identify the risk factors that may result in naloxone use within the inpatient setting at Henry Ford Hospital.
Discuss the calculation of a risk score for naloxone use.

Self Assessment Questions:
What side effect from opioid use is of the greatest concern for patients?
A: respiratory depression
B: miosis
C: constipation
D: pruritis

Naloxone can be used as a surrogate marker for:
A: opioid withdrawal
B: serious opioid harm
C: opioid related constipation
D: surgical opioid reversal procedures

Q1 Answer: A  Q2 Answer: B

EVALUATION OF STUDENT PHARMACISTS AWARENESS AND PERCEPTIONS OF BOARD CERTIFICATION

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Purpose: Pharmacy organizations including the American Pharmacists Association (APhA) and the American College of Clinical Pharmacy (ACCP) have published papers on the importance of certification through the Board of Pharmacy Specialties (BPS). APhA has called for BPS to collaborate with colleges of pharmacy to promote the value of certification by encouraging PharmD students to seek BPS certification upon graduation. The objective of this study is to: 1) determine awareness of BPS certification by current student pharmacists at all levels of pharmacy education, 2) evaluate student perceptions of effective educational formats for learning about BPS certification, and 3) assess students’ interest in obtaining BPS certification in future careers.

Methods: State boards of pharmacy in all 50 states were contacted to request licensed intern contact information; ten states provided a list of information. All students with valid electronic mail addresses were included and invited to participate in an online survey starting February 2011. Participants will be asked about awareness of board certification, where they learned about certification, interest in attaining certification, and factors influencing their plan to pursue or not pursue certification in the future, based on their knowledge and intentions at the time of the survey. Data will be collected on demographics, planned area of practice, specialties of interest, plans for postgraduate training, and participants’ opinions regarding potential requirements for BPS certification. Responses will be gathered from all years of student professional training. Data will be summarized using means and standard deviations for continuous variables, and percentages for categorical variables. Aggregate data will be reported for the study population, and by year of training.

Results: Measured outcomes will evaluate study objectives.

Conclusion: The results of this study may be used by colleges of pharmacy and professional organizations to assess current strategies for educating students on the BPS certification and improve education and advocacy efforts.

Learning Objectives:
Discuss the history and role of the Board of Pharmacy Specialties in the evolution of the role of a pharmacist in the current and future health care setting.
Identify what certification opportunities are currently available to student pharmacists through the Board of Pharmacy Specialties in their future careers.

Self Assessment Questions:
According to ACCPs vision, most clinical pharmacy practitioners who provide direct patient care will be board certified specialists by what year?
A: 2015
B: 2020
C: 2030
D: 2050

How many specialty certifications are currently available through the Board of Pharmacy Specialties?
A: 5
B: 6
C: 7
D: 8

Q1 Answer: C  Q2 Answer: B

ACPE Universal Activity Number 121-999-11-445 -L04-P
Activity Type: Knowledge-based  Contact Hours: 0.5
METHODS TO ESTABLISH CRITERIA FOR POTENTIAL SELECTIVE PROSPECTIVE MEDICATION ORDER REVIEW.
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Purpose: There is currently a lack of evidence to suggest that nearly universal prospective order review (NUPOR) in a post-CPOE setting is the optimum strategy for improving patient outcomes or is the most effective use of the pharmacists' time. The objective of this study is to determine if a pattern exists for pharmacy verification and intervention activity where medication orders associated with little or no evidence of pharmacy interventions can be identified, characterized, and separated from other medication orders.

Methods: In this single center, retrospective observational study, CPOE medication orders for adult inpatients at University Hospital (UH) will be assessed. After approval from an Institutional Review Board, medication orders will be collected over an eight-hour shift on sixteen non-random days, within a four-month period from January to April 2010. The medication orders that have low pharmacy intervention activity will be analyzed for patterns in medication order attributes. The attributes that will be evaluated include the medication order sentence frequency, order set "prescribed" status, time lapse between order entry and pharmacists verification, clinical decision support alert frequency, time lapse between order entry and discontinuation, and pharmacy intervention frequency. The pattern of attributes, if any are identified, will be analyzed for its reliability and validity in serving as the criteria for predicting medication orders associated with low pharmacy intervention activity and, therefore, potential for selective prospective order review (SPOR). Finally, a survey of pharmacists will be conducted to assess the likelihood that interventions would have been made on those identified medication orders categorized by little to no evidence of pharmacy intervention. A task group will be assembled to review the results of the study and determine if these methods can be implemented to reduce the pharmacists' efforts devoted to NUPOR medication processes.

Learning Objectives:
Describe the methods used to identify medication orders that potentially may not require prospective order review by the pharmacist.
Discuss the theory of selective prospective order review and the implications to the future of pharmacy practice.

Self Assessment Questions:

Which of the following medication order attributes was evaluated in the SPOR study?
A: Variability of medication order sentences
B: Purpose of clinical decision support alerts
C: Quality of pharmacy interventions
D: Rate of clinical decision support alert's severity level

Which of the following is considered a goal of the research concerning SPOR processes?
A: Decrease the amount of work performed by the pharmacist
B: Improve patient care through expansion of pharmacy services
C: Increase the number of clinical decision support alerts
D: Decrease the documentation requirements by pharmacists

Q1 Answer: A
Q2 Answer: B

ACPE Universal Activity Number 121-999-11-363 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5

EVALUATING THE CONCURRENT USE OF CHOLINESTERASE INHIBITORS AND ANTICHOLINERGIC MEDICATIONS IN A VETERAN POPULATION
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Purpose:
Prior studies have found that avoiding prescribing cascades and polypharmacy may reduce adverse drug events and inappropriate drug use. Cholinesterase inhibitors and anticholinergic medications have been found to be concurrently prescribed as a result of prescribing cascades, which ultimately leads to polypharmacy. The objective of the study is to determine the prevalence of the concurrent use of cholinesterase inhibitors and anticholinergics in a veteran population. Secondary endpoints are to determine the persistence of concurrent cholinesterase inhibitor and anticholinergic therapies six months after the start of cholinesterase inhibitor treatment and to determine if a change occurred in the prescribing practices of anticholinergic agents upon initiation of and throughout the duration of cholinesterase inhibitor use.

Methods:
A retrospective chart review of an anticipated 300 patients will be performed on those who were prescribed a cholinesterase inhibitor between January 2008 and March 2010. The primary endpoint will be the prevalence of the concurrent use of cholinesterase inhibitors and anticholinergics in veteran patients. Patients will be included in the study if they are greater than 18 years of age, are cholinesterase inhibitor naïve, and have been prescribed a cholinesterase inhibitor between January 2008 and March 2010. Patients will be excluded if there was a lapse in VA-provided healthcare for more than one year surrounding the prescribing of these medications. Data to be collected includes: age; gender; date of initiation, name, strength, dosing, duration of use, and patient compliance of cholinesterase inhibitor; date of initiation, name, strength, dosing, indication, and length of persistence of anticholinergic agent, if applicable; and reason for discontinuation of cholinesterase inhibitor, if applicable. Summary statistics will be conducted to determine results for both primary and secondary outcomes.

Results/Conclusions:
Results and conclusions of the study are pending and will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Define polypharmacy and prescribing cascade and explain how these two concepts are related.
Identify what medications are rated as Level 2 or Level 3 according to the Clinician-Rated Anticholinergic Scale.

Self Assessment Questions:

Which of the following statements is CORRECT?
A: Polypharmacy is the incorrect prescribing of a medication for an effect
B: A prescribing cascade is the initiation of a medication used for the treatment of another medication
C: Polypharmacy may cause a prescribing cascade, but a prescribing cascade may not cause polypharmacy
D: Polypharmacy and prescribing cascades are not common in the elderly population

Which of the following medications is considered a Level 3 medication according to the Clinician-Rated Anticholinergic Scale?
A: Loratadine
B: Nortriptyline
C: Olanzapine
D: Oxycodone

Q1 Answer: B
Q2 Answer: D

ACPE Universal Activity Number 121-999-11-249 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
TECHNOLOGIES IN MEDICAL COMMUNICATIONS

Learning Objectives:
- Describe how e-technologies are already being used by pharmaceutical companies.
- Identify what technologies are currently used by pharmaceutical companies for medical communication purposes to internal and external customers.

Self Assessment Questions:
- E-technologies are being used as part of what process by pharmaceutical companies:
  - A: corporate affairs
  - B: patient recruitment
  - C: medical communications
  - D: all of the above
- Currently what E-technologies are being used by pharmaceutical companies for medical communication purposes:
  - A: E-mail
  - B: phone
  - C: mobile device applications
  - D: conventional mail

Methods: A ten question survey was developed to collect information from participating pharmaceutical companies regarding medical communication department demographics, use of e-technologies for medical communications with external customers, use of e-technologies for medical communications with internal customers, e-technologies that are being considered for future use, and the primary challenges of integrating and using e-technologies. Medical communication departments will be emailed an electronic link to the anonymous and voluntary web-based survey.

Results/Conclusions: To be determined - data collection in progress.

Results will be presented at the Great Lakes Pharmacy Resident Conference.

A RETROSPECTIVE AND PROSPECTIVE CHART REVIEW COMPARING THE USE OF METHADONE WITH MORPHINE IN NEONATES TREATED FOR NEONATAL ABSTINENCE SYNDROME (NAS)

Purpose: Neonatal abstinence syndrome (NAS) is a disorder which includes both behavioral and physiological signs and symptoms in neonates delivered to women dependent on addictive substances during pregnancy. The purpose of this study is to determine whether morphine when compared to methadone, has a decreased neonatal length of stay both in the hospital and ICU. Secondary objectives include evaluation of NAS scores, opioid requirements, use of adjuvant therapy, and cost of treatment.

Methods: IRB approval was obtained. The health system previously used methadone for neonates with NAS, but recently changed to morphine. This conversion will be considered the time of intervention. The health systems pharmacy computer system will be used to identify neonates who received morphine as treatment for NAS for six months post intervention. The same system will be used to obtain an equal number of neonates who received NAS treatment with methadone. Inclusion criteria include in utero exposure to opioids as determined by maternal history, toxicology reports during pregnancy or at the time of delivery, or infant urine toxicology reports and symptoms of NAS requiring pharmacological treatment. Exclusion criteria include neonates transferred to another facility during treatment or diagnosed with iatrogenic NAS due to postnatal exposure to opioids. A retrospective and prospective chart review will be performed and the following data collected: maternal opioid use (drug(s), amount, duration, prescription medications), neonatal treatment information (toxicology screen results, NAS scores, hospital length of stay, ICU length of stay, daily maximum opioid dose, adjuvant therapy and dose, duration of treatment cost of treatment), and infant birth parameters (head circumference, body weight, gestational age, length, weight gain/growth after birth). All data will be recorded without identifiers to maintain patient confidentiality.

Results: Data collection is underway and results will be reported at the Great Lakes Residency Conference.

Learning Objectives:
- Describe the impact of morphine on length of stay in neonates treated for neonatal abstinence syndrome.
- Discuss the financial impact of morphine for the treatment of neonatal abstinence syndrome.

Self Assessment Questions:
- Which of the following statements is correct?
  - A: Morphine decreases length of stay in neonates treated for neonatal abstinence syndrome.
  - B: Morphine increases length of stay in neonates treated for neonatal abstinence syndrome.
  - C: Morphine does not affect length of stay in neonates treated for neonatal abstinence syndrome.
  - D: None of the above

Which of the following statements is correct?
- A: Morphine is a cost effective alternative to methadone for treatment of neonatal abstinence syndrome.
- B: Morphine is a more expensive alternative to methadone for treatment of neonatal abstinence syndrome.
- C: The financial impact of morphine and methadone are similar when used in treatment.
- D: None of the above
OUTCOMES OF CRITICALLY ILL PATIENTS WITH INTRA-ABDOMINAL INFECTIONS COLONIZED WITH VANCOMYCIN-RESISTANT ENTEROCOCCI

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Current guidelines for the management of intra-abdominal infections recommend source control and broad-spectrum antibiotics with the addition of vancomycin-resistant enterococci (VRE) antimicrobials for patients colonized with VRE. However, there is currently no published evidence to support the use of anti-VRE therapy in these patients. Therefore, the primary objective of this retrospective, observational, cohort study is to describe the clinical course of critically ill, VRE colonized patients with intra-abdominal infections, and to compare the clinical outcomes of those who received VRE antimicrobial therapy and those who did not.

Study patients will be identified through the University of Michigan Health Systems (UMHS) electronic medical record. Patients admitted to the surgical intensive care unit (SICU) from January 2008 to November 2011 with a positive rectal screen for VRE will be evaluated for inclusion. Critically ill patients at UMHS are screened for VRE colonization upon admission to the unit and on a weekly basis. Patients younger than 18 years old and those enrolled in other antibiotic studies will be excluded. The following data will be collected through chart review: patient demographics; comorbidities; Acute Physiology and Chronic Health Evaluation III (APACHE III) score; American Society of Anesthesiologists (ASA) score; length of stay; antimicrobial regimens and length of antimicrobial therapy; microbiological data; dates and type of surgical interventions; laboratory data; vital signs; and other relevant data as identified by study researchers. Provider documentation and the collected data will be reviewed to evaluate the clinical outcomes of each patient, which will be classified as a clinical success or failure. Clinical success will be defined as resolution of fever and leukocytosis, return of gut function, and completion of antimicrobial therapy within 6 weeks.

Data collection and analysis is currently ongoing. Results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:
Discuss the incidence of and the risk factors for VRE colonization.
Explain the clinical impact of VRE colonization.

Self Assessment Questions:
Which of the following is a risk factor for VRE colonization?
A Young adults
B Use of broad spectrum antibiotics
C Short hospital stay
D MRSA colonization

Which of the following statements regarding VRE is true?
A VRE colonized liver transplant recipients are less likely to develop
B VRE colonized liver transplant recipients have better clinical outcome
C Patients with VRE bacteremias have a higher mortality rate than patients with MRSA colonization
D Patients with VRE bacteremias have shorter lengths of hospital stay

Q1 Answer: B Q2 Answer: C

EVALUATING CARBOPLATIN DOSING AND INCIDENCE OF ADVERSE EFFECTS IN PATIENTS AT THE CINCINNATI VA: A RETROSPECTIVE COMPARISON OF COCKROFT-GAULT (CG) VS. MODIFICATION OF DIET IN RENAL DISEASE (MDRD)

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PURPOSE: To maximize carboplatin’s efficacy and minimize adverse effects, appropriate dosing using the Calvert equation requires an accurate estimate of the patients renal function. The objective of this study is to determine whether using the ideal body weight (IBW), adjusted ideal body weight (AIBW) or the MDRD formula, would result in significantly different dosages and incidence of adverse effects in patients who received carboplatin at the Cincinnati VA Medical Center.

METHODS: All patients who, between August 1998 and August 2010, received at least 1 dose of carboplatin and have documented target AUC will be identified using the VAs electronic medical record system. Patients who are amputees, on dialysis, receiving weekly low-dose carboplatin for chemo-sensitization, missing information needed for dose calculation, or whose dosage was capped by provider decision will be excluded. For each patient, a new estimated glomerular filtration rate (GFR) will be calculated using the 4-variable MDRD formula. Patients with body mass index (BMI) ≥ 27 will also have additional GFR values calculated using the CG formula, based on their IBW and AIBW. These new estimated GFR values will then be used in the Calvert formula to determine new carboplatin dosages. Comparing new dosages and the actual dosage will be the basis for separating patients into cohorts where differences are <20% or ≥20%. The prevalence of neutropenia and thrombocytopenia will be compared between the cohorts as well as to the entire patient population. The baseline characteristics and percent of patients whose calculated and actual dosages differed by ≥20% will be analyzed.

RESULTS/CONCLUSIONS: Data collection and analysis is currently in progress. Results and conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:
Review the impact using different body weights and CrCl formulas have on carboplatin dosing.
Recognize the main adverse effects of carboplatin.

Self Assessment Questions:
Carboplatin is cleared from the body primarily by the:
A Liver
B Kidneys
C Lungs
D Plasma esterases

The dose limiting toxicity of carboplatin is usually:
A Renal toxicity
B CNS toxicity
C Myelosuppression
D Cardiac toxicity

Q1 Answer: B Q2 Answer: C

ACPE Universal Activity Number 121-999-11-104 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
BARCODE MEDICATION ADMINISTRATION (BCMA) ANALYSIS OF MEDICATION ADMINISTRATION DOCUMENTATION ACCURACY AND BILLING PRE- AND POST-IMPLEMENTATION OF

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Propose: Aurora Health Care is a fifteen hospital health care system in Eastern Wisconsin. Aurora hospitals are in the process of converting to barcode medication administration (BCMA) as part of their transition to an electronic health record. Completeness and accuracy of medication administration documentation is critical to the patients clinical record as it provides guidance for patient care. The primary objective of this study is to evaluate the accuracy of documentation for medication administration using manual charting vs. barcode medication administration. In addition, the Aurora Health Care pharmacy department currently charges for medications based on medications dispensed and returned. However, changing this billing mechanism to charging upon administration is under consideration. A secondary objective is to evaluate the potential revenue gap when the methodology of charging is changed from charge on dispense to charge on chart.

Methods: Medication administration will be evaluated on inpatients at Aurora Sinai Medical Center in Milwaukee, WI. Data collection included a cross-section of the patient population excluding the well-baby nursery. Medications that were administered in the emergency department and the operating room will not be included in this study, as barcode medication administration (BCMA) is not performed in these areas. Data collected will be also be used in combination with the departments monthly Revenue and Usage reports to evaluate the potential revenue gap if the methodology of charge on chart is implemented.

Results/Conclusions: In total, documentation for 1803 and 1996 medication administrations was assessed pre- and post-BCMA respectively. Additional results and conclusions will be presented at Great Lakes Residency Conference.

Learning Objectives:
- Describe the importance of accurate medication documentation.
- Identify two financial implications when the methodology of charging is changed.

Self Assessment Questions:
- Accurate medication administration documentation entails:
  A: an increase in nursing medication documentation time
  B: completeness of the patient’s clinical record
  C: inaccurate billing to the patient
  D: nothing, it doesn’t matter if documentation is accurate

A positive financial implication of changing the methodology of charging is:
- A: Increased total revenue
- B: Decreased total revenue
- C: Decreased productivity
- D: No change in revenue

Q1 Answer: B     Q2 Answer: A

ACPE Universal Activity Number 121-999-11-444 -L04-P
Activity Type: Knowledge-based Contact Hours: 0.5

BLEEDING OUTCOMES ASSOCIATED WITH CORONARY ARTERY BYPASS GRAFT SURGERY AND RECENT CLOPIDOGREL EXPOSURE
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Purpose:
Current guidelines recommend discontinuing clopidogrel for 5 to 7 days prior to elective coronary artery bypass graft surgery (CABG) due to the increased risk of bleeding. This is largely based on The Clopidogrel in Unstable angina to prevent Recurrent ischemic Events (CURE) Trial, which randomized patients with a non-ST-elevation myocardial infarction to clopidogrel or placebo. Clopidogrel-treated patients had a significant reduction in cardiovascular death, myocardial infarction (MI) and stroke, however there was an increase in major and minor bleeding in those undergoing CABG within 5 days of stopping clopidogrel. Recent studies have conflicting results regarding whether recent exposure to clopidogrel (within 5 days prior to surgery) increases postoperative bleeding. The objective of this trial is to determine if there is an increased risk of postoperative major bleeding at OSUMC in patients undergoing isolated CABG with recent exposure to clopidogrel compared to those who did not receive clopidogrel within 5 days prior to surgery.

Methodology:
This is a retrospective chart review of adult patients who received isolated CABG from January 2008 to September 2010. Data collected includes demographics, patient risk factors, intraoperative and postoperative medications and blood products, and relevant laboratory values. The primary outcome is the incidence of postoperative major bleeding, defined as transfusion of ≥ 4 units of packed red blood cells (PRBCs) and/or need for reexploration. Secondary outcomes include non life-threatening bleeding defined as transfusion of ≥ 2 units, but < 4 units of PRBCs, postoperative complications, hospital length of stay, readmission within 30 days of procedure, hospital mortality, and mortality at 30 days. Logistic regression will be used to account for differences between the two study groups and paired t-test and Fishers exact test for within group comparisons.

Results and conclusions: Results will be presented at the residency conference.

Learning Objectives:
- Discuss risk factors for postoperative bleeding among patients undergoing coronary artery bypass surgery, including the impact of recent exposure to clopidogrel.
- Recognize the inconsistency of major bleeding definitions used in various trials in the literature and the impact it may have on clinical outcomes.

Self Assessment Questions:
- The CURE definition of major bleeding includes all but one of the following:
  A: Intraocular bleeding leading to loss of vision
  B: Bleeding necessitating transfusion of at least 4 units of blood
  C: Intracranial bleeding
  D: Substantially disabling bleeding

Risk factors that may contribute to major bleeding after coronary artery bypass surgery include
- A: Older age
- B: Number of distal anastomoses
- C: History of drug-eluting stent
- D: A and B

Q1 Answer: C     Q2 Answer: D

ACPE Universal Activity Number 121-999-11-230 -L01-P
Activity Type: Knowledge-based Contact Hours: 0.5
Purpose: Hematopoietic stem cell transplant (HSCT) patients experience long periods of neutropenia and are highly susceptible to infection. In heterogeneous patient populations levofloxacin prophylaxis given at neutropenia has been shown to decrease febrile episodes and incidence of hospitalization but not overall mortality. Increased resistance is of potential concern. National Comprehensive Cancer Network (NCCN) guidelines suggest practitioners should consider fluoroquinolone prophylaxis in HSCT patients, though no studies are in this patient population. In August of 2010, an antibacterial prophylaxis policy was implemented at Rush University Medical Center, Chicago, IL. Neutropenic HSCT patients received levofloxacin from the start of neutropenia until its resolution.

Methods: Patients who have received allogenic and autologous stem cell transplants 1 year previous and 10 months after policy initiation will be included. The health-systems electronic medical record and a blood and marrow database will be used to collect the following data: patient age, gender, type of hematologic cancer, type of HSCT, length of hospital stay, number of febrile episodes, antibiotic therapy, type and number of infections, pertinent hematological findings, survival at 30 days and 100 days after transplant, and the incidence of graft-versus-host disease. Patients will be matched to within plus or minus 5 years of age and type of HSCT. Absolute neutrophil count will be calculated at first febrile episode, as well as number of days from neutropenia to febrile episode. Data analysis will include comparison of incidence of neutropenic fever and a regression analysis to determine contributing factors. Microbiological data will also be reported for each group.

Learning Objectives:
Name the most common pathogen to infect neutropenic patients.
Recognize the most common measure used to detect infection in neutropenic patients.

Self Assessment Questions:
What pathogen most commonly infects neutropenic patients?
A: E. coli  B: Streptococcus  C: Mycobacterium  D: C. difficile

What is the most common measure of infection in a neutropenic patient?
A: Red cell count  B: Temperature  C: Blood pressure  D: White cell count

Q1 Answer: A  Q2 Answer: B

ACPE Universal Activity Number 121-999-11-426-L04-P
Activity Type: Knowledge-based  Contact Hours: 0.5