IMPLEMENTATION AND EVALUATION OF INSTITUTIONAL PHYTONADIONE GUIDELINES FOR USE IN PATIENTS RECEIVING ORAL ANTICOAGULATION.

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Purpose: Anticoagulation therapy is used for the prevention of primary and secondary thromboembolic events. While anticoagulation therapy is effective, the risk of bleeding complications exists if patients are not monitored for the appropriate intensity of anticoagulation. Phytonadione is an option to reverse over-anticoagulated patients. However, inappropriate doses and routes of administration of phytonadione may lead to an increased risk for thromboembolic complications, adverse events, and may prolong hospitalizations. In the spring of 2006, a medication use evaluation (MUE) was conducted to evaluate the appropriateness of phytonadione use for over-anticoagulated patients, pre-procedure anticoagulated patients, and patients with hemorrhagic events while on anticoagulation therapy. The results of this MUE were compared to the recommendations given in the 2004 CHEST guidelines by Ansell, et. al. The discrepancies between the MUE results and the current recommendations prompted the need for institutional guidelines. The purpose of this evaluation is to develop, implement and assess institutional guidelines for the use of phytonadione in patients receiving warfarin. The results of this study will serve to further evaluate the need for protocol initiation.

Methods: This study is a retrospective, observational, descriptive analysis of patients receiving phytonadione oral anticoagulant reversal during March 2007. Exclusion criteria include pregnant women and prisoners. A report will be generated daily to identify patients that received phytonadione for anticoagulation reversal. All data regarding phytonadione administration will be recorded including dose, route and frequency of administration, indication, and international normalized ratio (INR) to assess adherence to the implemented guidelines. All adverse drug events will be recorded, in addition to the patient's length of stay.

Results: Results and conclusions are pending and will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Review the indications for the use of phytonadione.

Review the appropriate use of phytonadione for the reversal of oral anticoagulation.

Self Assessment Questions:

A 53 y.o. white male, s/p recent CABG and h/o atrial fibrillation presents to emergency department with an INR of 1.9 with uncontrollable, potentially life- threatening bleeding. This patient is a candidate for phytonadione therapy. T/F

For the patient mentioned above, phytonadione should be given subcutaneously at 5 to 10 mg. T/F

USE OF INSULIN GLARGINE WITH TIGHT GLYCEMIC CONTROL IN CRITICALLY ILL SURGICAL PATIENTS

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Background: Hyperglycemia is common in diabetic and non-diabetic critically ill patients. Using tight glycemic control to maintain normoglycemia (80-110mg/dl) significantly reduces mortality, organ dysfunction, length of stay, and rate of infection in critically ill surgical patients. Hypoglycemia is the main disadvantage. Subcutaneous insulin glargine mimics endogenous insulin action because it has no peak, and has a steady time action profile over 24 hours. Insulin glargine had a flat concentration/action profile mimicking continuous subcutaneous infusion of insulin lispro. When compared with insulin NPH, insulin glargine was associated with less nocturnal hypoglycemia and lower post prandial glucose levels in type 2 diabetic patients. No studies have been performed in the use of long acting insulin e.g. insulin glargine, with the tight glycemic control in critically ill patients.
Purpose: To compare glycemic control using our current tight glycemic protocol to the current tight glycemic protocol plus insulin glargine in critically ill surgical patients.
Methodology: This will be an open label retrospective and prospective study. Ten retrospective critically ill surgical patients greater than 18 years of age receiving mechanical ventilation with tight glycemic control will be compared to ten prospective consecutive patients assigned to tight glycemic control plus insulin glargine for 5 days.
The insulin glargine dose will be 70% of the total insulin dose over the previous 24 hours. The dose will be given as a subcutaneous injection at 10:00 am every day with additional insulin given based on the tight glycemic control protocol used by the Surgical Critical Care Service. Primary endpoints will be percentage of blood glucose values higher than 139mg/dl and less than 100mg/dl. Secondary endpoints include number of dextrose rescue doses per patient days, total number of insulin units per 24 hours, and average blood glucose.
Results: Pending.
Conclusion: Pending.

Learning Objectives:

Describe the advantages of tight glycemic control to maintain normoglycemia in diabetic and non-diabetic critically ill patients.

Describe the role of insulin glargine in improving tight glycemic control in critically ill patients.

Self Assessment Questions:

What are the advantages of maintaining normoglycemia in critically ill patients?

What is the potential role of insulin glargine in improving tight glycemic control in critically ill patients?

COMPARISON OF SAFETY AND EFFICACY BETWEEN OLD AND UPDATED YALE PROTOCOL AS TIGHT GLYCEMIC CONTROL IN CRITICALLY ILL SURGICAL PATIENTS

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Background: Hyperglycemia is common in diabetic and non-diabetic critically ill patients. Using tight glycemic control to maintain normoglycemia (80-110mg/dl) significantly reduces mortality, organ dysfunction, length of stay, and rate of infection in critically ill surgical patients. Hypoglycemia is the main disadvantage. Tight glycemic control for critically ill patients has become the standard of care in many hospitals.
The Surgical critical care service at the University of Toledo Medical Center (UTMC) recently adopted the original Yale insulin infusion protocol in 2006, and then adopted the updated Yale protocol in March 2007.
Purpose: To evaluate and compare the safety and effectiveness of two insulin protocols in critically ill surgical patients
Methodology: This will be an open label retrospective chart review study. Twenty critically ill surgical patients greater than 18 years of age receiving mechanical ventilation with the original Yale protocol will be compared to twenty prospective consecutive patients assigned to the updated Yale protocol Retrospective patients will be selected based on a pharmacy data information system which will identify patients who received insulin drips after October 1, 2006. Prospective patients will be enrolled after full implementation of the new protocol. Primary endpoints will be percentage of blood glucose values within target range of protocol. Secondary endpoints include number of dextrose rescue doses per patient days, total number of insulin units per 24 hours, mean blood glucose level after target achieved, and mean blood glucose.
Results: Pending.
Conclusion: Pending.

Learning Objectives:

Describe the advantages of tight glycemic control to maintain normoglycemia in diabetic and non-diabetic critically ill patients.

Describe the roles of the two Yale protocols in tight glycemic control in critically ill patients.

Self Assessment Questions:

What are the advantages of maintaining normoglycemia in critically ill patients?

What are the potential roles of the two Yale protocols in tight glycemic control in critically ill patients?

MAXIMUM EFFECTIVE DOSE OF NOREPINEPHRINE WHICH YIELDS INDIFFERENT MORTALITY RATES WITH DOSE ESCALATION

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Norepinephrine and dopamine are recognized as first line vasopressors in the management of hemodynamic instability in septic shock. Several small studies resulted favorably to norepinephrine compared to dopamine and epinephrine in achieving and maintaining normal hemodynamic parameters, oxygen transport, and yielding decreased or indifferent mortality and morbidity rates. Norepinephrine utilization has increased secondary to evidence based guidelines and small studies recommendations. The available literature fails to provide a definitive maximum effective dose for norepinephrine. Guidelines and clinical trials report wide dosing ranges (0.1 to 5 mcg/kg/min) for norepinephrine. This study assists in defining a maximum effective dose of norepinephrine.
The primary endpoint of the study is to identify at what dose or dosing range of norepinephrine will yield indifferent mortality rates with dose escalations.
This study is a retrospective chart review of 294 adult patients who received norepinephrine in the medical intensive care unit (MICU) at Henry Ford Hospital from January 1, 2005 to December 31, 2005. Patients were excluded from the study if norepinephrine ordered by the physician was not received by patient.
Patients who received norepinephrine will be evaluated for a maximal norepinephrine dose and mortality outcome. Enrolled patients baseline and background characteristics, along with confounding variables were collected for analysis.
Of the 600 charts reviewed 294 patients were eligible for inclusion. The mean maximum dose used for all patients was 32 mcg/min 30 (0.4 mcg/kg/min). The mean maximum dose used for patients who resulted in death was 45 mcg/min 33 (0.6 mcg/kg/min) compared to 19 mcg/min 18 (0.25 mcg/kg/min) in patients who survived. The mortality rate of patients who received norepinephrine was 51% (n=150). Confounding factors will be applied to these results and presented at the conference.
This retrospective study suggests that the maximum dose of norepinephrine should be around 45 mcg/min.

Learning Objectives:

Discuss the management of hemodynamic instability with vasopressors in the critically ill.

Review the literature that supports the use of norepinephrine in patients with shock.

Self Assessment Questions:

The use of norepinephrine in patients with septic shock is associated with an increased mortality rate. True or False

Mortality rates decrease as norepinephrine dose is titrated up. True or False

AN EVALUATION OF ALEMTUZUMAB FOR INDUCTION IMMUNOSUPPRESSION IN RENAL TRANSPLANTATION

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Purpose: Induction immunosuppression in solid organ transplant recipients has been shown to decrease the incidence of acute graft rejection. Alemtuzumab is an antineoplastic agent used off-label for induction. The purpose of this study is to compare adverse events and graft survival associated with the use of alemtuzumab to other induction therapies in renal transplant recipients at Rush University Medical Center.

Methods: The institution's patient database was used to identify renal transplant recipients 18 years of age and older who received antibody-based induction therapy from January 1, 2003 to October 31, 2006. Data collected from a retrospective chart review included patient age, induction/maintenance therapy used, dosage, number of doses received, time to rejection (if applicable), immunological match/mismatch, cytomegalovirus status of donor/recipient, immunosuppressant levels, complete blood count, serum creatinine and blood urea nitrogen. The primary outcome is the incidence of adverse events, defined as percentage of patients with documented infusion-related reactions, hematologic toxicities or infectious complications attributed to study medications. Secondary outcomes include the incidence of graft rejection at six months and overall graft survival during the study period. Univariate, bivariate, and multivariate analysis will be used to analyze collected data.

Results: Data collection is currently in progress.

Learning Objectives:

Explain the mechanism of action of alemtuzumab.

Identify serious adverse effects of alemtuzumab.

Self Assessment Questions:

1. What is the mechanism of action of alemtuzumab?
   a.Inhibit the production of interleukin II
   b.Inhibition of purine synthesis and proliferation of lymphocytes
   c.Interference with cellular metabolism
   d.Lysis of lymphocytes from complement activation and antibody-
      dependent cellular toxicity
   e.Elimination of antigen-reactive T lymphocytes in the peripheral blood

2.The product labeling for alemtuzumab includes a black box warning
  regarding which of the following?
  a.Hematologic toxicities
  b.Infectious complications
  c.Infusion-related reactions
  d.All of the above
  e.None of the above

EVALUATION OF FILGRASTIM IN LIVER TRANSPLANT PATIENTS

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Purpose:
Two common complications of liver transplant are infection and graft rejection. The incidence of infection can be correlated with several factors, including the potentially contaminated abdominal cavity, the tenuous state of liver failure patients, and hematological abnormalities. Neutropenia is common in liver transplant recipients due to medication side effects, viral infections, or immunologic reaction to the liver graft and /or immunosuppressive medications.
Several studies have examined the use of filgrastim (human granulocyte colony-stimulating factor; G-CSF) in chemotherapy-induced neutropenia. However, few evaluate the indications, safety profile and benefits of filgrastim in the liver transplant population.

The primary endpoint of this study was the difference in duration of neutropenia between liver transplant patients treated with filgrastim, versus those not treated with filgrastim. The secondary endpoints were the differences in incidences of infection and rejection in patients treated with filgrastim versus those not treated.

Methods:
This study included 60 liver transplant patients diagnosed with neutropenia between January 1, 2000 and June 30, 2006. Neutropenia was defined as an absolute neutrophil count (ANC) <1000/L. Patients receiving care at clinics other than CCHMC and patients receiving multi-visceral transplants were excluded. Data collected included patient demographics, disease state prior to transplant, concurrent medications, time after transplant neutropenia was documented, ANC (pre and post treatment), use of filgrastim therapy (indication, dose, frequency, duration), duration of the neutropenia, and number of infection/rejection episodes.

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

Learning Objectives:

Describe a post liver transplant patient who might benefit from filgrastim treatment of neutropenia.

Explain the potential relationship between filgrastim and the development of infection in pediatric liver transplant patients with neutropenia.

Self Assessment Questions:

T/FThe risk of infection increases with the severity and duration of neutropenia in pediatric liver transplant patients.

T/FNeutropenia in liver transplant patients can be caused by medication side effects, viral infections, or an immunologic reaction to the liver graft.

ASSESSMENT OF BETA-BLOCKER USE: REACHING A TARGET HEART RATE IN VASCULAR POSTOPERATIVE PATIENTS

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BACKGROUND: Many Americans are at a high risk of experiencing cardiovascular accidents due to coronary artery disease, diabetes mellitus, hypertension, or other co-morbid conditions. When these patients undergo non-cardiac surgery, postoperative myocardial ischemia and myocardial infarction within the first week of surgery are major causes of morbidity and mortality. The use of beta-blockers peri-operatively to control heart rate has been shown to significantly decrease the number of fatal and non-fatal myocardial infarctions in this patient population. Consequently, the Vascular Surgery Performance Improvement Program (VSPIP) developed an order set in April 2005 which includes initiation of beta-blockers for vascular postoperative patients at risk for myocardial infarction. The goal heart rate for these patients is between fifty-five and seventy beats per minute.

PURPOSE: The purpose of this study is to assess the influence of the vascular surgery order set in initiation of a beta-blocker postoperatively to reach and maintain a heart rate within the goal range.

METHODS: A list of patients eighteen or older who underwent non-cardiac, vascular surgery at Methodist Hospital in Indianapolis, Indiana between January 1 and December 31 of 2004 and 2006 was obtained from Clarian Health Decision Support. Patients were excluded if discharged within twenty-four hours of surgery, pregnant, or if medical records were unavailable at the time of data collection. A retrospective chart review comparing one hundred randomly selected patients before and one hundred randomly selected patients after initiation of the order set was performed. Blood pressures, heart rates, beta-blocker use, adverse events, and risk factors for cardiac complications were collected. Data within the first seventy-two hours following vascular surgery were included in the analysis.

RESULTS and CONCLUSIONS: To be discussed upon completion of data collection.

Learning Objectives:

List three peri-operative interventions used to decrease the risk of morbidity and mortality in patients undergoing non-cardiac vascular surgery.

Describe the mechanism by which beta-blockers are cardio-protective in patients who have undergone non-cardiac, vascular surgery.

Self Assessment Questions:

Initiation of a beta-blocker postoperatively is sufficient for cardio-protection in patients who have undergone non-cardiac, vascular surgery. T/F

Goal heart rate of 95 beats per minute or less is appropriate in a post-operative non-cardiac, vascular surgery patient. T/F

VANCOMYCIN-RESISTANT ENTEROCOCCI (VRE) BACTEREMIA IN A COHORT OF ACUTE MYELOID LEUKEMIA (AML) PATIENTS

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Background:
The prevalence of VRE infections has been increasing annually since it was first identified in the late 1980s. Risk factors for developing VRE infections include immunosuppression, neutropenia, hospitalization in an ICU or oncology ward, use of broad-spectrum antibiotics, extended length of stay, and proximity to a VRE-colonized patient. The mortality associated with VRE bacteremia in cancer patients has been reported to be as high as 37%, and colonization with VRE increases the risk for bloodstream infection. Between September 2005 and April 2006, a cluster of VRE bacteremia was identified in the Hematology-Oncology Unit (HOU) at Cleveland Clinic.

The purpose of this study is to determine if antibiotic therapies in a group of patients influenced the development of VRE bacteremia and to assess the relationship of AML chemotherapy regimens and neutropenia to VRE bacteremia.

Methodology:
Retrospective, case-control study. Criteria for case subjects include diagnosis of AML, hospitalization in the HOU between September 2005 and April 2006, and greater than one positive blood culture for VRE. Criteria for control subjects include diagnosis of AML and hospitalization in the HOU between September 2005 and April 2006. Relationship of antimicrobial therapies to development of VRE will be evaluated by determining antibiotic use within 1 month prior to hospitalization, antibiotics received during hospitalization and total duration, and sensitivities of VRE strains. The relationship of chemotherapy to VRE bacteremia will be assessed by identifying the type of regimen and chemotherapy agents used. The total duration of neutropenia as well as duration of neutropenia prior to VRE bacteremia will also be evaluated. All study parameters of the case cohort will be compared to those of the control group.

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

Learning Objectives:

Identify established risk factors for VRE infection.

Describe the rationale for potential influences of AML chemotherapy regimens on the development of VRE bacteremia.

Self Assessment Questions:

Which of the following have been associated with a high risk for infectious complications of VRE?

a. Neutropenia
b. Female gender
c. Previous antibiotic use
d. A and C
e. None of the above

True or false: The majority of documented VRE infections are Enterococcus faecium.

VALIDATION OF A WEIGHT-BASED ARGATROBAN NOMOGRAM IN A COMMUNITY TEACHING HOSPITAL

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PURPOSE: Studies have demonstrated subtherapeutic levels of anticoagulation are associated with sub-optimal clinical outcomes, including a higher incidence of recurrent venous thromboemboli (VTE). While individual trials have proven the efficacy of unfractionated and low molecular weight heparins as therapies in the treatment of VTE, no published data exists evaluating the efficacy of argatroban weight-based infusions to achieve and maintain therapeutic anticoagulation in the setting of heparin-induced thrombocytopenia (HIT). This study's purpose is to validate an argatroban nomogram developed for our institution adjusting for hepatic impairment and obesity.

OBJECTIVES: The primary objective of the study is to determine the mean time to stabilization (two consecutive therapeutic activated partial thromboplastin times (aPTTs)) and percentage of patients whose aPTT values fell within the therapeutic range (45-90 seconds) at 6, 12, 24, and 48 hours. Secondary objectives include determining the percentage of patients whose aPTT were supratherapeutic and subtherapeutic at 6, 12, 24, and 48 hours, and number of major bleeds during the study period.

METHODS: A retrospective chart review was performed on patients initiated on the argatroban nomogram while in the hospital. Charts were reviewed for demographics (age, gender, weight, height) and pertinent lab values (albumin, AST, ALT, Alk Phos, total bilirubin, INR, PT, aPTT, Hgb, HIT antibody results). A "major bleed" was defined as a decrease in hemoglobin of more than 2 g/dL, transfusion of two or more units of blood, or bleeding in the retroperitoneum, cranium, or prosthetic joint. A "minor bleed" was defined as any bleeding episode not represented by the definition of a major bleeding.

RESULTS/CONCLUSION: Data analysis, results, and conclusions will be presented at the conference.

Learning Objectives:

To assess the reliability of a validated argatroban nomogram in a standard and hepatic/critically ill population.

To identify those patients who should not be dosed using the nomogram.

Self Assessment Questions:

An 81 year old critically ill patient with hepatic impairment would be a good candidate to be dosed with argatroban using the nomogram. T/F

A weight-based argatroban nomogram adjusting for hepatic impairment provides adequate anticoagulation in greater than ____% of patients by 48 hours.
a. 50%
b. 75%
c. 90%
d. 95%

HOSPITAL-ACQUIRED VENOUS THROMBOEMBOLISM: EVALUATION OF RISK FACTOR ASSESSMENT AND THROMBOPROPHYLAXIS

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Purpose: The National Consensus Standards for the Prevention and Care of Venous Thromboembolism (VTE) project initiated by JCAHO includes performance measures to evaluate documentation of risk assessment within 24 hours of hospital admission or transfer to an ICU and prophylaxis for VTE. The goal of this study was to evaluate institutional compliance with these proposed measures and to identify opportunities for improvement.

Methods: A retrospective chart review was conducted for all patients diagnosed with a VTE event at the institution between January 1, 2006 and June 30, 2006. Patients were included if the diagnosis occurred during the hospital admission or on readmission within 30 days of previous discharge. Patients were excluded if the diagnosis was present on admission and they had not been hospitalized within the previous 30 days, if the diagnosis could not be confirmed objectively, or if the patient was less than 18 years old. Patients were considered eligible for thromboprophylaxis if they had 2 or more risk factors for VTE present without contraindications. If thromboprophylaxis was prescribed, underlying factors were examined to determine if prophylaxis was appropriate.

Results: 15.5% of study patients were identified as having a hospital-acquired VTE. Risk assessment at the time of admission was documented in 14.5% of patients, but risk assessment for VTE upon transfer to an ICU was not evaluated due to lack of documentation. Of the patients with a hospital-acquired VTE who were eligible for prophlaxis, 28.8% received no prophylaxis. Additionally, 14.3% of prescribed pharmacologic prophylaxis regimens were considered inappropriately dosed. Further results and statistical data are pending and will be presented.

Conclusion: This study has shown the need to improve the institution's method of assessing and documenting the patient's risk for VTE and the need to improve consistency in providing appropriate thromboprophylaxis.

Learning Objectives:

Apply recommendations for VTE risk assessment and thromboprophylaxis to institutional practice

Identify risk factors for VTE and patients who would be eligible for mechanical or pharmacological prophylaxis.

Self Assessment Questions:

Medical patients are not usually at risk for VTE and do not require risk assessment or prophylaxis. T/F

Low rates of risk assessment may be attributed to a lack of awareness of VTE, difficulty identifying risk factors and their impact, and a lack of a validated risk assessment tool. T/F

ESTABLISHING AN OFFICE-BASED PRACTICE MODEL BETWEEN AN INDEPENDENT PHYSICIAN AND AN INDEPENDENT PHARMACY

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Background: With the advent of Medicare Part D, pharmacists have the opportunity to provide and receive compensation for medication therapy management (MTM) services. By working collaboratively with a physician, a pharmacist may be able to improve patient care by:
1)Ensuring treatment of all diagnoses,
2)Ensuring proper dosing of all medications,
3)Evaluating the efficacy and/or unwanted effects of the patient's medication therapy, and
4)Supporting the adherence of the patient's medication regimens.

A collaborative practice relationship between pharmacists and physicians is not a new concept. The pharmacy literature reports examples of such practices, primarily pharmacist-run clinics, such as anti-coagulation, pain, cardiovascular, and diabetes clinics. While these practices have been shown to have successful patient and practice outcomes, the development of community based collaborative practices in which pharmacists are working in tandem with physicians to care for a diverse patient population are more rare and analyses of the processes establishing these practices is even more rare.

Purpose: To provide a descriptive case report and analysis of the planning, creation, implementation, and evaluation of a community oriented office-based practice model between an independent community pharmacy and an independent physician.
Methods: The steps involved in establishing a collaborative practice fall into five distinct, yet related, categories:
1.Determine the patient care services provided, as well as the resources necessary to provide those services
2.Identify a practice model for consistent client fulfillment and service delivery
3.Develop a financial management system for the model
4.Plan and implement a marketing plan for the model to a variety of groups (patients, other providers, payers).
5.Create a strategy for the assessment of practice, financial, and patient outcomes of the model.

Results/Conclusions: The data collected during the planning, development, implementation, and evaluation of this practice will be presented at the residency conference.

Learning Objectives:

To determine how to establish an office-based practice between an independent physician and an independent pharmacy.

To determine if such a practice can be sustained and maintained over a long period of time.

Self Assessment Questions:

Is the model created replicable between other pharmacies and physicians?

Is it possible for physicians and pharmacists to collaborate in the care of more than one disease state, i.e., non-disease state specific clinics?

COST COMPARISON OF BIOLOGIC RESPONSE MODIFIERS USED IN THE TREATMENT OF RHEUMATOID ARTHRITIS COVERED BY PHARMACY BENEFIT VERSUS MAJOR MEDICAL COVERAGE

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Introduction: Rheumatoid arthritis (RA) is a chronic and progressive autoimmune disease that affects 2.1 million Americans. The effects of RA can often times be debilitating and result in joint destruction. Treatment for this condition may require the use of disease modifying anti-rheumatic drug (DMARD) such as expensive biologic response modifiers (BRMs) which are considered specialty pharmaceutical products. Specialty products are characterized as medications that generally utilize a parenteral route of administration, have special storage requirements, necessitate close monitoring of drug therapy, require support from specially trained health care professionals, and are significantly more costly than traditional medications. Depending on variations between employer health plans, specialty products may be covered under the pharmacy benefit or built into the cost of major medical coverage. Pharmacy Benefit Managers (PBMs) can often negotiate for discounted rates on pharmaceuticals such as specialty products.

Objective: The purpose of this study was to determine the difference in drug cost for BRMs covered by the pharmacy benefit versus major medical coverage.

Methods: Pharmacy and medical claims data for three commonly prescribed BRMs for RA (etanercept, adalimumab, and infliximab) maintained in a large PBM's database were retrospectively analyzed for drug cost from January 1, 2005 to December 31, 2005. National Drug Codes (NDCs) were used to identify drug costs billed to the PBM for study BRMs. Healthcare Common Procedure Coding System (HCPCS) J codes, specific to medical billing of specialty products, were used to identify drug costs billed to major medical coverage for study BRMs. The drug costs per claim type for individual agents were averaged and compared using an independent t-test to detect significant differences between groups.

Results/Conclusions:
Pending completion of data collection.

Learning Objectives:

1. Discuss the place in therapy of BRMs used in the treatment of rheumatoid arthritis.

2. Determine the impact on drug cost for BRMs covered by the PBM versus major medical coverage.

Self Assessment Questions:

1. What is the place in therapy of BRMs used in the treatment of RA?

2. True or False: Coverage of BRMs by a PBM can yield lower drug cost compared to coverage under the major medical benefit?

A PLACEBO-CONTROLLED, RANDOMIZED, DOUBLE BLIND COMPARISON OF PLACEBO VS. SHORT-COURSE LOW DOSE CORTICOSTEROIDS ON POSTTRAUMATIC STRESS DISORDER (PTSD)

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Purpose: PTSD is a psychiatric disorder commonly seen in the combat veteran population. Current pharmacological treatment options often leave patients with residual symptoms, reducing quality of life and increasing health care costs.

PTSD symptoms may correlate with patterns of Hypothalamic-Pituitary-Adrenal (HPA) axis dysregulation. Patients with PTSD have been shown to produce high levels of both dehydroepiandrosterone (DHEA) and cortisol, which may be involved with the down-regulation of the HPA axis response to traumatic stress, increasing symptom severity. Our study attempts to determine if supplementing the body with a short course of steroid, thereby affecting the HPA-axis negative feedback system and increasing cortisol levels from baseline level, is safe and effective in reducing PTSD symptoms.

Methods: Forty-eight subjects will be randomized to receive either 20mg prednisone or matching placebo once daily for 14 days. Symptom severity is assessed at baseline, 2, 6 and 12 weeks using the Clinician-Administered PTSD Scale (CAPS), Hamilton Depression Scale (HAM-D), Clinical Global Impressions Severity Scale (CGI-S) and the PCL-PTSD. Dehydroepiandrosterone sulphate (DHEA-S) and a Chem-7 are collected at baseline and each follow up visit. Salivary cortisol levels are collected at baseline, 2, 6 and 12 weeks. Telephone calls to the patient are made on days 7 and 21 to monitor for adverse effects. Pre-existent psychotropic medications may be continued throughout the study with no dose change. Psychotherapy may be continued. Clinical response will be defined as =30% improvement in CAPS. Secondary endpoints include changes in HAMD, PCL-PTSD and CGI-S scores from baseline to completion of study medication.

Results: Ongoing trial.

Conclusions: The pharmacologic options for PTSD patients are relatively limited. If our study is successful, short course prednisone could add an additional option to the current therapies available, thus increasing the quality of life for those affected by this debilitating disorder.

Learning Objectives:

Identify the symptoms of PTSD and describe its impact on society

Explain the theories related to HPA-axis involvement in PTSD symptom severity and detail the theoretical role of prednisone in reducing these symptoms

Self Assessment Questions:

According to the DSM-IV, symptoms of PTSD include:
I.Hypertension
II.Startle
III.Weight gain
IV.All of the above

If we checked cortisol levels at 12 weeks in the active drug study group, we would expect levels to be _____ compared to baseline levels.
I.Decreased
II.Increased
III.Unchanged
IV.Variable

CHARACTERISTICS AND OUTCOMES OF PATIENTS WITH PERSISTENT METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS BACTEREMIA AT AN ACADEMIC MEDICAL CENTER

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Purpose: The incidence of hospital- and community-acquired Staphylococcus aureus bacteremia (SAB) has significantly increased over the past few decades. Resistance to methicillin among S. aureus (MRSA) is a growing problem. SAB is associated with significant morbidity and mortality. Persistent (> 3 days) MRSA bacteremia is often attributed to an endovascular source, delayed removal of the implicated source, or inadequate antibiotic therapy. The recognition of vancomycin-intermediate and -resistant strains and the development of new antibiotics, including linezolid, daptomycin, and tigecycline have resulted in a reassessment of how best to treat persistent MRSA bacteremia. The objective of this study is to describe the characteristics and outcomes of patients with persistent MRSA bacteremia.
Methods: All adult patients with a positive blood culture for MRSA for > 3 days were identified during the time period of 1/1/06-12/31/06. Data collected included: age, gender, source and duration of bacteremia, culture and susceptibility, duration of antibiotic therapy, vancomycin concentrations, and mortality.
Results: Persistent MRSA bacteremia was identified in 42 patients (mean age 55 years, 74% male). The most common source was an intravascular catheter, which was removed in 79% of patients. The mean duration of bacteremia and vancomycin therapy were 25 and 16 days respectively. A vancomycin concentration <10 g/mL was observed in 21 patients. Eight patients received an alternative antibiotic (mean duration until change 15 days) and 13 patients received combination therapy of vancomycin plus gentamicin or rifampin (mean duration until addition 7 days). Ten patients who received vancomycin monotherapy experienced a relapse. A 15% mortality rate was observed; the source of infection was not removed in these patients.
Conclusions: Patients with persistent MRSA bacteremia must have the focus of infection promptly removed and receive effective antibiotic treatment. Vancomycin therapy must be optimized and alternative therapy should be considered in patients who do not clinically respond.

Learning Objectives:

Describe risk factors associated with the development of MRSA bacteremia

Understand the treatment options for patients with persistent MRSA bacteremia

Self Assessment Questions:

T/F Resistance to methicillin among S. aureus is not a significant problem

T/F Daptomycin demonstrates no activity against MRSA

LIPID OUTCOMES OF A PHARMACIST-MANAGED SHARED MEDICAL APPOINTMENT

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Purpose: Numerous studies have described the initiation of different types of group visits and have evaluated their improvements in patient satisfaction and provider satisfaction. In addition, the value of individual appointments in a pharmacy clinic to attain lipid goals based on ATP-III guidelines has been documented. The objective of this study is to describe and evaluate the effects of a pharmacist-managed heart disease risk reduction clinic utilizing the group appointment format.

Methodology: This study will be a retrospective chart review using the facility's electronic record system to identify patients with high risk for heart disease risk as defined by NCEP ATP-III guidelines, with a goal low-density lipoprotein (LDL) less than 100 mg/dL. Some of these patients were recruited into the heart disease risk reduction clinic, while some were managed by usual care, defined as seeing their primary provider for management of dyslipidemia. Inclusion criteria consists of a diagnosis of hyperlipidemia, LDL goal greater than 100 mg/dL and more than one set of laboratory values. Patients will be excluded if they had no labs beyond baseline, were seen by a specialist, were not compliant or had an LDL goal of 130mg/dL or 160mg/dL. The primary objective studied will be the percentage of patients reaching their LDL goal in the study group, those managed by the shared medical appointment, compared to the control group, those managed by usual care. Data collected included demographic data (such as age and gender), baseline and most recent total cholesterol, LDL, high-density lipoprotein, triglycerides and blood pressure. The study period will be from May 2005 to June 2006. After data collection, data will be analyzed utilizing the chi-square test and t-test as appropriate to determine statistical significance.

Results/Conclusions: Data is currently being collected and will be presented at the conference.

Learning Objectives:

Describe the benefits of group appointments

Describe the ability of group appointments to achieve therapeutic goals

Self Assessment Questions:

True of False? Group appointments have been demonstrated to improve both patient and provider satisfaction

True of False? Group appointments have an equivalent ability to reach LDL goals in comparison with usual care

VALUE OF CLINICAL PHARMACISTS TO FAMILY MEDICINE RESIDENCY PROGRAMS: A SURVEY OF FAMILY MEDICINE RESIDENTS AND FACULTY

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Background and Purpose: Clinical pharmacists have been involved with Family Medicine Residency Programs (FMRPs) since the 1970s. A recent survey revealed that pharmacists are involved in about 30% of FMRPs nationwide. The pharmacists surveyed reported that the majority of their time is spent in patient care activities and teaching family medicine residents and pharmacy students. It has been demonstrated that physicians in family medicine clinics generally have a positive perception of pharmacy encounters related to patient care activities; however, data describing FMRP's perceptions of clinical pharmacist activities, including teaching, are lacking. The primary outcome of this study is to determine the value of clinical pharmacists involved in FMRPs and the perceived value of adding a clinical pharmacist for programs in which one is not involved.

Methodology: A survey was developed regarding the value of inpatient and outpatient clinical pharmacists. Survey respondents are asked to indicate the level of value placed on teaching and patient care activities typically performed by clinical pharmacists and rank the top three most important. Respondents not currently utilizing clinical pharmacists are questioned regarding whether adding clinical pharmacists would be valuable to their FMRP. Demographic data (type of institution, year in the program, years in practice, professional designation, location of medical degree, age, and gender) are also collected. Family medicine residents and faculty of all programs accredited by the Accreditation Council for Graduate Medical Education (ACGME) and/or American Osteopathic Association (AOA) in Indiana will be included. The surveys will be administered at the Indiana Academy of Family Physicians Faculty Development Workshop and Resident's Day and Research Forum in March 2007 and via mail. Statistical methods will be used to summarize and compare data.

Results: Data collection will commence, pending investigational review board approval.

Conclusion: The conclusion of the study will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Describe the current status of clinical pharmacy involvement with FMRPs.

List the two most common activities performed by clinical pharmacists involved in FMRPs.

Self Assessment Questions:

True or False? The number of clinical pharmacists involved in FMRPs has decreased over the last several years.

True or False? Clinical pharmacists involved in FMRPs spend the majority of their time educating medical residents and pharmacy students.

CLINICAL EFFECTIVENESS AND SAFETY OF A GEMFIBROZIL TO FENOFIBRATE CONVERSION IN VETERANS

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PURPOSE:
The primary objective of this study is to determine the mean difference in triglycerides after switching patients from gemfibrozil to fenofibrate. The secondary objectives are to determine the number of patients with adverse events, defined as increases in liver function tests, serum creatinine, creatinine kinase, or subjective symptoms of muscle pain or weakness, and to determine the mean difference in low density lipoprotein, high density lipoprotein, total cholesterol, and non-HDL.

METHODS:
A retrospective chart review will be performed on patients who were switched from gemfibrozil to fenofibrate from January 1, 2000 to September 30, 2006 at the Chalmers P. Wylie Veterans Affairs Outpatient Clinic. The patient population will be generated using a fileman report to locate all the patients that were switched from gemfibrozil to fenofibrate during this time. Patients will be included if they were on a stable dose of gemfibrozil for at least 3 months prior to conversion to fenofibrate. Patients will be excluded if there is evidence of non-compliance before or after the conversion from gemfibrozil to fenofibrate; they did not obtain labs prior to switch from gemfibrozil to fenofibrate; they did not have labs drawn 2 months or later following the start of fenofibrate, or they were not on stable doses of other antihyperlipidemic medications for 2 months prior to the switch from gemfibrozil to fenofibrate and until after the study period. The lipid panels were analyzed using Cobas Integra 700 machine until June 25, 2006 and then the equipment was changed to Day Dimension RXL, which was used from June 26, 2006 until completion of the study.

RESULTS/CONCLUSIONS: Data collection is in progress. Results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Determine efficacy of triglyceride lowering in patients treated with fenofibrate compared to gemfibrozil.

Determine safety of fenofibrate compared to gemfibrozil.

Self Assessment Questions:

Is there a significant difference in triglyceride lowering when patients are converted from gemfibrozil to fenofibrate?

True or False: Patients on fenofibrate experience significant increases in low density lipoprotein compared to those on gemfibrozil.

DEVELOPMENT OF AN ORTHOPEDIC PERIOPERATIVE ANTICOAGULATION MANAGEMENT SERVICE TO ACHIEVE THE JCAHO NATIONAL PATIENT SAFETY GOAL

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BACKGROUND:
Deep vein thrombosis (DVT) and pulmonary embolism are major causes of morbidity and mortality in the orthopedic surgery population, with an incidence of 50-60%. Perioperative anticoagulation for prophylaxis of venous thromboembolism is extremely important in this population. The JCAHO National Patient Safety Goals, Requirements, and Implementation Expectations for 2007 calls for reducing the likelihood of patient harm associated with anticoagulation therapy. This requires monitoring and follow-up of warfarin, and includes dose adjustments and patient education monitoring of side effects, compliance, dietary restrictions, drug interactions, and safety.

PURPOSE:
To create a pharmacist-managed anticoagulation service for perioperative orthopedic surgery patients with the objective of meeting the 2007 JCAHO National Patient Safety Goal.

METHODS:
The primary objective is to increase time patients are within the INR therapeutic range. The secondary objectives are 1) effectively bridging patients from warfarin to heparin during the perioperative period, 2) communicate with the physicians and patients in a timely manner, 3) decrease patient misadventures, 4) determine patient and physician satisfaction, and 5) determine FTE needs for expanding the service to all orthopedic surgeons.

The project included a three month pilot during which patients seen by two participating orthopedic surgeons requiring anticoagulation were eligible. Anticoagulation was managed by inpatient clinical pharmacists until discharge and then by the outpatient anticoagulation service after discharge. Patients received INR draws twice weekly until stable and then weekly until the completion of therapy. INR results were either obtained by point of care testing or venipuncture depending on the individual's discharge plans. Results were telephoned to the anticoagulation service, dose adjustments were made, and labs were ordered. The pharmacist spoke with the patient assessing for new drug or diet interactions, complications, and compliance. The patient and physician both completed a questionnaire evaluating the service provided.

RESULTS/CONCLUSIONS: Research is in progress.

Learning Objectives:

Identify the complexities of developing a telephone based anticoagulation service in an orthopedic population.

Describe the impact of an anticoagulation service on the participating orthopedic population.

Self Assessment Questions:

Orthopedic surgery patients have the highest prevalence of DVT.
a)True
b)False

According to the recent JCAHO National Patient Safety Goals for 2007 outpatient anticoagulation monitoring is required. Which of the following is not included in the required monitoring?
a)Discussing possible drug and food interactions with warfarin
b)Discussing the risks and benefits of anticoagulation
c)Calling the patient daily to see how they are doing on the anticoagulation
d)Stress the importance of compliance while taking anticoagulation

ASSESSING THE USE OF THE GLUCOSTABILIZER FOR INSULIN INFUSIONS IN PATIENTS PRESENTING WITH DIABETIC KETOACIDOSIS (DKA).

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Background: Diabetic ketoacidosis (DKA) is a life threatening acute complication of diabetes mellitus. Management can be broken into categories: fluid and electrolyte therapy, insulin therapy, treatment of precipitating causes, and monitoring of therapy and complications, such as cerebral edema. The risk for complications can be minimized by avoiding a rapid decline in blood glucose concentrations and adding dextrose to the fluids once the glucose level drops to 250 mg/dL or less.

The IV GlucoStabilizer is a computerized insulin infusion program that has been implemented for all titrated insulin infusions. It calculates insulin infusion rates with an algebraic equation. However, the GlucoStabilizer has not been adequately studied for use in patients with DKA.

Purpose: The purpose is to assess the use of the IV GlucoStabilizer compared to historical treatment prior to when the GlucoStabilizer was used in the subset of patients with a diagnosis of DKA.

Methods: This is a retrospective chart review of patients admitted between January 1, 2006 and December 31, 2006 with a primary or secondary diagnosis of DKA and started on the IV GlucoStabilizer. The control patients were admitted in 2002 with a diagnosis of DKA per discharge diagnosis coding and received the historical treatment. A list was generated for all patients meeting criteria, and 35 patients were randomly selected from each group to be included.

Results: Information currently being collected and analyzed includes patient demographics, blood glucose levels, including time to achieve a blood glucose = 250 mg/dL, the timeframe for the initiation of fluids, electrolyte replacement, whether or not sodium bicarbonate was given as part of the treatment regimen, and adverse events of therapy.

Learning Objectives:

Understand appropriate treatment options for a patient with a diagnosis of diabetic ketoacidosis (DKA).

Explain the mechanics of the GlucoStabilizer insulin infusion program and how it affects the management of a patient's insulin regimen.

Self Assessment Questions:

It is recommended to add dextrose into the maintenance IV fluids once the patient's blood glucose drops below what level?
A)300 mg/dL
B)275 mg/dL
C)250 mg/dL
D)200 mg/dL
E)dextrose should not be added to MIVF in a DKA patient

True or False. Cerebral edema is a complication of DKA that occurs due to decreasing blood glucose levels too quickly.

PRESCRIBING PRACTICES FOR BETA-BLOCKER USE AT DISCHARGE IN PATIENTS WITH CONGESTIVE HEART FAILURE

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Background: Heart failure (HF) is a common condition characterized by considerable morbidity and mortality. An estimated five million Americans currently have heart failure and approximately 550,000 new cases are diagnosed each year. The American College of Cardiology/American Heart Association (ACC/AHA) guidelines recommend the use of a beta-blocker as a class I recommendation for all patients with stable heart failure unless they have a contraindication. Despite established therapies and growing therapeutic options, treatment of heart failure continues to be a problem. Studies show that patients fail to receive beta-blockers as part of standard therapy when left for the outpatient prescriber to initiate. According to an international survey, of the 60% of patients receiving an ACE inhibitor, only 20% received both a beta-blocker and ACE inhibitor. It is expected that organizations such as the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) and the Center for Medicare and Medicaid Services (CMS) will make beta-blockers at discharge a new core measure in late 20075. Currently, the compliance with this core measure is an outpatient initiative.

Purpose: The objective of this project is to increase the percentage of patients discharged on a beta-blocker from Sinai-Grace Hospital by providing education to prescribers. In addition, we will determine the most appropriate and cost-effective beta-blocker for our patient population.

Methods: The study will be a retrospective record review. All patients, ages 18-99, admitted with new onset or history of heart failure, and admitted from August 2006 through March 2007 at Sinai-Grace Hospital will be included. The following data points will be collected: age, gender, ethnicity, date of admission, date of discharge, ejection fraction, beta-blocker on admit, beta-blocker at discharge, choice of beta-blocker, contraindications, and type of insurance.

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

Learning Objectives:

1. List the Beta-blockers used in heart failure that reduce morbidity and mortality.
2. Discuss the importance of initiating beta-blocker therapy in an inpatient hospital setting.

Self Assessment Questions:

True or False: All patients with stable heart failure should receive Beta-blocker therapy unless contraindicated.

True or False: Addition of a Beta-blocker in patients with heart failure decreases morbidity and mortality.

ADVERSE DRUG REACTION DOCUMENTATION: IDENTIFICATION AND ASSESSMENT OF PERCEIVED BARRIERS AS A PRELIMINARY STEP TOWARD INCREASED REPORTING

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Purpose:

Each year over 2 million serious adverse drug reactions (ADRs) occur in the United States. Although the number of deaths vary by study, it is suggested that approximately 100,000 patients die yearly as a result of such reactions. In context, ADRs are the 4th to 6th leading cause of death, ahead of automobile accidents and diseases such as AIDS, pneumonia, and diabetes.

Many governing bodies such as the ASHP, JCAHO and the FDA have developed programs or set standards which detail the importance of recognizing and reporting ADRs. Reporting ADRs is a vital component of all healthcare systems. One benefit of reporting is increased practitioner awareness of various adverse reactions and their potential clinical consequences. This awareness can result in improved use of pharmaceuticals, increased patient safety, and increased quality of life. Unfortunately, barriers to and misconceptions of reporting exist and overall reporting rates are low.

At the Detroit Medical Center (DMC), ADRs are reported through an electronic program called DoctorQuality. Historical reporting rates indicate that this program is underutilized by healthcare professionals. The purpose of this study is to determine why healthcare providers underreport ADRs. Data will be used to design specific initiatives to promote awareness of ADRs and increase individual reporting.

Methods:

A ten item questionnaire was developed and piloted in a small group of pharmacists to ensure accuracy of survey interpretation. The revised survey was distributed over a one-week period with a goal of reaching as many of the targeted healthcare professionals as possible. A Microsoft Excel database was developed to collate and evaluate survey responses based on practice site, profession, and years of professional practice.

Results/Conclusion:

Total of 58 surveys were completed with responses received from all targeted professions. Analysis of results is ongoing. Results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Understand the definition of ADRs and the importance of reporting.

Discuss the differences in perceptions of and barriers to reporting ADRs among professions.

Self Assessment Questions:

What barriers exist to reporting adverse drug reactions?

What role can pharmacists play in adverse drug reaction reporting?

EVALUATION OF FEASIBILITY OF PHARMACY TECHNICIAN OBTAINED MEDICATION HISTORIES IN IDENTIFIED HIGH RISK/COMPLEX PATIENTS

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Objective: The ASHP 2015 Initiative encourages pharmacy involvement in medication reconciliation and obtaining medication histories and JCAHO requires it as a National Patient Safety Goal. Aurora Health Care is exploring the most efficient way for pharmacy to manage the acquisition of medication histories for 75% of hospital inpatients with complex and high-risk medication regimens. Pharmacy managed medication histories will help to prevent medication errors and patient harm. The objectives of this project are to develop criteria for selection of complex patients that would most benefit from pharmacy obtained medication histories, to assess the time requirements by technicians and pharmacists to obtain medication histories, to establish the benefits of pharmacy obtained medication histories for pharmacists, nurses, and physicians, and to develop practice guidelines for technician/pharmacist performed medication histories.

Methodology: A literature review was performed to create selection criteria identifying high-risk, complex patients requiring pharmacy obtained medication histories. Teams of pharmacy technicians and pharmacists were established and trained how to obtain medication histories. Using the developed selection criteria, pharmacy technicians will obtain the medication histories on the study unit for those patients identified as complex and high risk. The floor pharmacist will review each medication history to ensure accuracy. On the comparator unit, nurses and physician assistants will obtain the medication histories, as is the normal procedure. On the study unit, the time taken for each technician to obtain the history will be recorded. On both the study and control units, the amount of time taken by the pharmacist to review and clarify the medication histories, and the number of clarifications will be recorded. Results will be analyzed and assessed for the benefit and feasibility of having a technician/pharmacist team obtain medication histories on selected patients.

Conclusion: The results and conclusion will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Demonstrate the value of a technician performed medication history and assess the time requirements by technicians to obtain medication histories.

Describe practice guidelines for technician/pharmacist performed medication histories.

Self Assessment Questions:

The ASHP 2015 Initiative requires pharmacists to be involved in the acquisition, upon admission, of medication histories for 75% of hospital inpatients with complex and high-risk medication regimens. (T/F)

Polypharmacy and advanced age have not been proven to put patients at increased risk for adverse drug events. (T/F)

EVALUATION OF MONITORING FOR METABOLIC COMPLICATIONS IN PATIENTS RECEIVING ATYPICAL ANTIPSYCHOTICS

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BACKGROUND: Atypical antipsychotics (AAPs) are widely used today in clinical practice for the treatment of disorders such as schizophrenia and bipolar disorder. However, their use can be limited by the potential to cause a variety of adverse effects, specifically metabolic disturbances, which include weight gain, hyperglycemia/diabetes, and lipid abnormalities. It has been shown that significant weight gain can occur in as little as 4 weeks after initiation of an AAP. The FDA has recommended monitoring for these potential metabolic disturbances and guidelines for monitoring have been established by various organizations, including the Jesse Brown VA Medical Center (JBVAMC). It is important for clinicians to aggressively monitor for these potential disturbances due to the impact these effects have on coronary heart disease morbidity and mortality. The importance of strict adherence to these guidelines is especially true in diabetic patients, as diabetes is already associated with increased morbidity and mortality due to micro- and macrovascular complications.

PURPOSE: This study will be performed to investigate how effectively JBVAMC clinicians are monitoring patients on AAPs based on institution guidelines. The secondary objective is to determine how the goals of treatment for JBVAMC patients with diabetes receiving an AAP compare to VA data and national data for diabetic patients.

METHODS: This study will be a retrospective chart review of patients with an active prescription for an AAP filled between July 1, 2006 and October 31, 2006. Patients will be included if they are between the ages of 18 and 65 years of age and have received an AAP for a minimum of 4 weeks. The following data will be collected: demographics, AAP used, duration of AAP therapy, prescribing service of the AAP, selected laboratory values, selected concomitant drug therapy, preventative care received, and clinic contact/referrals.

RESULTS/CONCLUSIONS: Data collection and analysis are ongoing.

Learning Objectives:

Determine the regularity with which regular monitoring occurs in our veteran population.

Discuss the impact on patient outcomes of monitoring metabolic events associated with atypical antipsychotics.

Self Assessment Questions:

True or False: Metabolic events can occur in as little as 4 weeks after initiation of an atypical antipsychotic.

True or False: Individuals with schizophrenia have about a 45% shorter life expectancy than the general population.

RETROSPECTIVE EVALUATION OF IVIG USE IN THE TREATMENT OF TOXIC EPIDERMAL NECROLYSIS AND STEVENS-JOHNSON SYNDROME

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Background: Stevens-Johnson syndrome (SJS) and toxic epidermal necrolysis (TEN) are rare idiosyncratic adverse drug reactions that are associated with a high mortality, ranging from 1-5% in SJS to 25-35% in TEN. To date, the treatments for SJS and TEN remain unclear. Current management includes adjuvant therapies and supportive care. The administration of intravenous immunoglobulin (IVIG) may hold promise in treating these cutaneous drug reactions due to its ability to inhibit Fas-mediated keratinocyte apoptosis. Currently, limited data are available describing the utility of IVIG, and the optimal dose has not been elucidated.

Purpose: The purpose of this study is to further elucidate the therapeutic potential, as well as the applied dosing regimens, of IVIG used in SJS and TEN.

Methods: This retrospective chart review included patients with a diagnosis of SJS or TEN admitted to Detroit Receiving Hospital from January 1997 to October 2006. Patients were included if there was a diagnosis of SJS or TEN, and subsequently divided into treatment or standard of care groups based on whether or not they received IVIG. Data collected included baseline patient demographic information, past medical history, APACHE II score, SCORTEN score (where applicable), hospital and ICU length of stay, date of initial signs and symptoms of SJS or TEN, percentage of skin involvement, causative medications that may have precipitated SJS or TEN, dosage of IVIG utilized, IVIG adverse effects, other medications or therapeutic modalities used in the treatment of SJS or TEN, dates of initial and complete skin healing.

Results: Data collection is still in progress. Results and conclusions will be presented at the conference.

Learning Objectives:

To assess the utility of IVIG in treating SJS and TEN

To identify the appropriate dosing of IVIG in treating SJS and TEN

Self Assessment Questions:

It is believed that all brands of IVIG are equal in terms of efficacy in the treatment of SJS and TEN. T/F

Which of the following BEST describes the mechanism in which IVIG is believed to slow/stop epidermal detachment in SJS and TEN

A. Intracellular inhibition of cAMP production
B. Anti-Fas antibodies that block the immune mediated cell death of keratinocytes
C. Direct inhibition of Interleukin - 6
D. Potentiation of macrophage activity

EVALUATION OF GLUCOMETER TEST STRIP RECIPIENTS NOT RECEIVING ANTIHYPERLIPIDEMICS

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PURPOSE: The purpose of this study is to evaluate patients at Jesse Brown Veterans Affairs Medical Center (JBVAMC) with active prescriptions for glucometer test strips not concurrently prescribed antihyperlipidemics as of July 28, 2006. Guidelines suggest the use of antihyperlipidemics, such as HMG CoA reductase inhibitors (statins), for prevention of coronary artery disease (CAD). Patients with diabetes mellitus (DM) are at greater risk of cardiovascular events that are more fatal and occur at a younger age than those without DM. Lipid management as well as blood pressure and glycemic control are imperative in the risk reduction of vascular disease. Both the National Cholesterol Education Program Adult Treatment Panel III guidelines (NCEP ATP III) and the American Diabetes Association (ADA) advocate aggressive lipid management in patients with DM. Additionally, there is information to suggest that all patients with DM, regardless of the initial lipid panel, should be on a statin.

METHODS: Electronic charts will be retrospectively reviewed from a computer generated list of patients with active prescriptions for glucometer test strips that did not have an active prescription for a lipid lowering agent as of July 28, 2006. Data will be collected from January 1, 2000 through November 15, 2006. All JBVAMC campuses will be included. Data collected to assess the need for lipid lowering therapies and understand the rationale for therapies not yet initiated will include: diagnoses for diabetes, hyperlipidemia, coronary artery disease, or alcohol abuse, active hypoglycemic or antihyperlipidemic medications, allergies / adverse drug reactions, glycosylated hemoglobin (A1c), low-density lipoprotein cholesterol (LDL), aspartate aminotransferase (AST), alanine aminotransferase (ALT), thyroid stimulating hormone (TSH), hepatitis C antibody and viral load (if applicable), general medicine clinic (GMC) progress notes to assess rationale for non-adherence such as patient refusal, and medication lists, including discontinued or expired prescriptions.

Learning Objectives:

Discuss the rationale of statin therapy in patients with DM or glucose intolerance.

Recognize patients that may benefit with statin therapy.

Self Assessment Questions:

True/False - Patient with DM benefit from statin therapy only due to their lipid lowering ability.

Do patients with glucose intolerance benefit from statin therapy?

NATIONAL SURVEY OF ACUTE HYPERTENSION MANAGEMENT

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Purpose: Practice guidelines are developed so patients may benefit from an evidence-based, standardized approach to patient care. They are designed to analyze and grade the quality of studies and generate a recommendation based on that evidence. For the critically ill patient, examples of these efforts are the recently published guidelines for sedation and neuromuscular blockade. Currently, no national practice guideline exists for the treatment of hypertensive emergency in the critically ill patient. We believe that one of the first steps towards standardizing the practice approach to the patient with hypertensive emergency is to document the way that antihypertensives are prepared, selected, dosed, and used.

The primary objective of this study is to characterize how intravenous antihypertensive agents are used in the management of hypertensive emergency. The secondary objectives will include describing the variability of anti-hypertensive agents currently used with respect to dosage, duration, and preparation. We also plan to describe the perceived incidence of adverse drug events that may accompany the use of these agents. We believe these data might provide critical care practitioners with insight into the current treatment of hypertensive emergency. Furthermore, we hope that these results may also provide background information for a potential new practice guideline for the treatment of hypertensive emergency in the critically ill patient.

Methods: Critical care physicians and pharmacists who are members of the Society of Critical Care Medicine (SCCM) will be invited to participate in the survey. The study received approval from the institutional review board. Once approved by the Executive Research Committee at SCCM, the above-mentioned will receive an e-mail invitation to participate in a survey regarding their perception of the management of acute hypertension in their respective practice areas.

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

Learning Objectives:

Describe how antihypertensives are used in the management of hypertensive emergency in various practice settings.

Delineate the variability of anti-hypertensive agents currently used with respect to dosage, duration, and preparation.

Self Assessment Questions:

A national guideline currently exists for the treatment of hypertensive emergency in the critically ill patient. T or F

Perception of the management of hypertensive emergency varies between different practice settings. T or F

THE PREVALENCE OF METABOLIC SYNDROME ASSOCIATED WITH THE USE OF SECOND-GENERATION ANTIPSYCHOTIC AGENTS

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Purpose:
Second-Generation Antipsychotics (SGA) have been implicated in increasing the metabolic burden in patients, thereby increasing cardiovascular risk. Federal guidelines recommend frequent monitoring for metabolic changes in patients utilizing SGA agents. Evaluating the utilization and monitoring of SGA in the Veterans Affairs Ann Arbor Healthcare System (VAAAHS) will help quantify the risk of metabolic syndrome and determine the current clinician monitoring. This data will be linked to other measures of cardiovascular risk.

The primary objective is to determine the prevalence of metabolic syndrome in patients with a history of SGA use for a minimum of six consecutive months. Secondary objectives include determining the relationship between SGA and length of therapy with the occurrence of metabolic syndrome, determining frequency of clinician monitoring of metabolic factors during treatment, and reporting mean cardiovascular risk change, defined by Framingham risk score, over the study period.

Methods:
This retrospective study will be completed on VAAAHS patients whose prescription files indicate a minimum of six-month consecutive utilization of a SGA during the period of October 1, 2004 through September 30, 2006. Descriptive statistics will be used to address the primary objective. Drug utilization variables will be analyzed for a relationship between metabolic changes and SGA agent, dose and length of therapy. Multivariate logistic regression will be used to examine the association between metabolic syndrome and potential predictor variables. Mean change in cardiovascular risk will be evaluated and clinician monitoring will be assessed to identify areas for improved patient care.

Results:
Data collection is in progress. The prevalence of metabolic syndrome in VAAAHS patients utilizing SGA will be presented. The association of metabolic syndrome with factors such as SGA treatment patterns and the frequency of clinician monitoring of metabolic factors during therapy will be characterized. Changes in cardiovascular risk in this patient population will be presented.

Learning Objectives:

To understand the metabolic burden and the cardiovascular risk changes that may be associated with the use of SGA medications.

To describe the rationale for implementing a monitoring program for patients utilizing SGA by clinicians.

Self Assessment Questions:

Patients utilizing Second-Generation Antipsychotics (SGA) may be at increased risk of developing metabolic syndrome and for this reason the consensus guidelines from the ADA/APA provide guidance on the use of SGA agents based on their relative potential to cause metabolic abnormalities. True or False?

Recommendations for baseline monitoring of patients starting SGA treatment include all of the following except:
a. Blood Pressure
b. Fasting lipid panel
c. C-Reactive Protein
d. Weight
e. Height

ASSESSING THE ROLE OF DRUG THERAPY PROBLEMS ON THE NEED FOR RAPID RESPONSE TEAM

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Background: The 100,000 lives campaign launched by the Institute for Healthcare Improvement (IHI) endorses the need for rapid response teams (RRT) to reduce preventable deaths in hospitals. RRTs developed after many studies found that patients who had a cardiopulmonary arrest or unplanned admission to the ICU had signs of clinical deterioration prior to the event. Research of medication management prior to RRT activation is currently limited.

Purpose: The purpose of this study is to describe patient care 24-hours prior to RRT activation at a tertiary teaching hospital, specifically concentrating on drug therapy problems (DTPs). In addition, identification of other non-drug therapeutic management interventions, monitoring parameters, number/type (invasive and non-invasive) of procedures, current disease states, and primary locations of RRT activations in the institution will also be evaluated.

Methods: A retrospective chart review of 86 RRT activations between 06/01/2005 to 05/31/2006 was completed. Exclusions were patients who were less than 18 years old, proceeded to full code prior to RRT involvement, or were located in the ICU, CCU, pediatric, or psychiatric units. DTPs were identified through the collection and review of pre-specified data 24-hours prior to RRT activation, including: medication administration record, age, gender, length of stay, location of RRT, allergies/intolerances, medical conditions, criteria for RRT activation, number/type of procedures (invasive vs. non-invasive), review of systems, heart rate, respiratory rate, blood pressure, and temperature. DTPs were identified using a model of pharmaceutical care. Statistical analysis using binomial distribution as the primary analysis will be completed following completion of data collection.

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

Learning Objectives:

Identify patients based on identification of drug therapy problems who are at risk for RRT activation.

Understand patient characteristics and situations that might precipitate RRT activation.

Self Assessment Questions:

Patients who have had a cardiopulmonary arrest or unplanned admission to the ICU have shown signs of clinical deterioration prior to the event. T or F

Pharmacists can identify patients who may be at risk for RRT activation by actively identifying drug therapy problems. T or F

A PATIENT FOCUSED PROTOCOL FOR THE EVALUATION AND MANAGEMENT OF ANALGESIA, SEDATION AND DELIRIUM: THE APPEASE STUDY

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Maximizing patient comfort in the intensive care unit (ICU) is a goal for all practitioners and published guidelines are in place for direction.1 Daily interruption of sedative infusion in patients requiring mechanical ventilation may decrease ventilator days and length of stay, but is often impractical in some patients requiring continuous analgesia. We hypothesize that implementation of a patient specific, goal directed, nurse managed, analgesia-sedation-delirium protocol that avoids daily interruption of narcotic and sedative infusions will lead to decreased ventilator days and length of stay in a surgical ICU.

This retrospective study will be conducted in the surgical intensive care unit (SICU) at The University Hospital, in Cincinnati, Ohio. An interdisciplinary team developed an evidence-based protocol that uses validated objective methods to assess pain, agitation and delirium as guidance for medication administration. Following implementation of the protocol, all mechanically ventilated patients 18 years of age in the SICU during the first 6-month period will be eligible for inclusion. Information to be collected includes: APACHE II scores, alcohol/illegal drug use, protocol compliance, Richmond Agitation and Sedation Scale (RASS) scores, Confusion Assessment Method for ICU (CAM-ICU) features, visual analog scale/objective pain assessment scale (VAS/OPAS) scores, sedation/analgesia/delirium medication use, and duration of medication use. The primary outcomes will be protocol adherence; sedation, analgesia and delirium medication use; ventilator days; hospital and ICU length of stay; VAP episodes; and self-extubation occurrences. Protocol non-adherence will be defined as (1) any mechanically ventilated patient > 18 years not placed on the protocol, (2) pain, agitation, and delirium assessments not recorded or (3) medications not titrated according to protocol. Primary and secondary outcomes will be compared to a 6-month pre-protocol implementation cohort of mechanically ventilated patients admitted to the SICU.

Preliminary results indicate a decrease in ventilator days, ICU and hospital lengths of stay.

Learning Objectives:

Evaluate the use of a sedation protocol in a SICU without daily wakeups and effects on ventilator days, ICU and hospital length of stay

Monitor continuous sedative medications versus intermittent usage.

Self Assessment Questions:

Appropriate sedation can be achieved for surgical ICU patients without the use of continuous sedation medications? T or F

Proper assessment of pain, sedation, and delirium can be achieved in mechanically ventilated patients? T or F

EVALUATION OF ADVERSE EVENTS IN PATIENTS SWITCHED TO DOXAZOSIN AFTER HAVING DOCUMENTED ADVERSE EVENTS WITH TERAZOSIN

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Background: Benign prostatic hypertrophy (BPH) is a commonly treated disease-state amongst elderly males in the U.S. The most common treatment for BPH is the alpha blocker agents, however, the use of these agents is often limited due to the risk of postural side effects. At the Jesse Brown Veterans Affairs Medical Center (JBVAMC), the preferred treatment for BPH is the non-selective alpha blocker, terazosin. In patients that do not tolerate terazosin due to non-postural events, it is recommended to try another non-selective agent, doxazosin. In patients who do experience postural events, it is recommended to proceed to tamsulosin, a more costly, non-formulary agent with alpha-1a selectivity. These recommendations reflect the goals of providing safe and cost-effective therapy. Additionally, current literature has not demonstrated that intolerance with one non-selective agent implies intolerance will occur with another.
Purpose: The purpose of the proposed study is to evaluate the adverse event outcomes in patients switched to doxazosin after experiencing adverse events with terazosin.
Methodology: A retrospective chart review will be conducted for 221 JBVAMC patients who used terazosin for BPH treatment, experienced an adverse event, and switched to doxazosin. The time frame of the study is between September 1, 2001 and September 1, 2006. Patients will be evaluated for the frequency of adverse event occurrences. Adverse events will be characterized as either postural or non-postural. Duration of time prior to event occurrence will be evaluated as well. Finally, the incidence of a particular adverse event occurring with both agents will be evaluated for all reported events.
Results: Pending
Conclusions: Pending

Learning Objectives:

Characterize the alpha blocker adverse events as either postural or non-postural and understand the implications of each to the safety of the patient.

Recognize the appropriate factors to consider in choosing alpha blocker therapy including history of use and response, cost of therapy, and influence from current literature.

Self Assessment Questions:

Converting to tamsulosin vs doxazosin provides a significant safety benefit for patients who experience non-postural side effects during a trial with terazosin for BPH therapy. T/F

Name 3 adverse events that might lead to intolerance with a non-selective alpha blocker that would not preclude a trial with a different non-selective alpha blocker. Name 1 adverse event that would preclude such a trial.

EVALUATION OF PATIENT OUTCOMES WITH A PHARMACY AND NURSING COORDINATED CANCER CLINIC ANTIEMETIC PROTOCOL

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Purpose: An antiemetic protocol based on guidelines from ASCO, NCCN, and MASCC has been instituted at the University of Wisconsin Hospital and Clinics (UWHC). Regimen selection is based on the emetic potential of the prescribed chemotherapy. Patient-reported outcomes of nausea/vomiting incidence and impact on quality of life are being used to assess the efficacy of the protocol's regimens in preventing and treating chemotherapy-induced nausea and vomiting.

Methods: Patients eighteen years or older who are starting Cycle 1 of a chemotherapy regimen, receiving chemotherapy in the UWHC Cancer Center, and are prescribed antiemetics per protocol are being screened for enrollment. The target enrollment in this clinical study is one hundred patients, which should provide a representative sampling of all four levels of emetic risk, as well as a variety of cancer diagnoses. Enrolled patients complete a two-part survey which collects information about incidence of nausea or vomiting, and the impact that nausea and vomiting have on quality of life. Quality of life is measured by the Modified Functional Life Index-Emesis (MFLIE) scale. Patients complete these surveys in clinic prior to chemotherapy on the first day of the first four cycles, and at 72 hours after chemotherapy administrations. Patients are called by the primary investigator to remind them to complete the form. Data will be stratified based on emetic potential of the chemotherapy regimen and cancer diagnosis.

Results: Patient outcomes are currently being collected and evaluated to assess protocol-derived regimen efficacy. Results and conclusions will be presented to UWHC physician, nursing and pharmacy staff to report the initial outcomes of the UW Cancer Clinic Antiemetic Protocol, including further protocol modifications as needed based on risk stratification or cancer diagnosis.

Learning Objectives:

Be able to describe the rationale for implementation of a pharmacy and nursing-coordinated antiemetic protocol for use in ambulatory chemotherapy patients in an academic cancer center.

Be able to explain the use of protocols based on chemotherapy emetic potential to select an initial prophylactic and treatment regimen.

Self Assessment Questions:

Determine which emetic potential category a particular chemotherapy regimen would fall into, and then select the appropriate initial antiemetic regimen.

What potential benefits are conferred by having pharmacy and nursing staff coordinate prescribing of antiemetic therapy?

EVALUATION OF MICROORGANISMS RESPONSIBLE FOR EARLY VERSUS LATE-ONSET HOSPITAL-ACQUIRED PNEUMONIA IN INTENSIVE CARE UNIT PATIENTS

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BACKGROUND: Hospital-acquired pneumonia (HAP) is pneumonia that occurs 48 hours or more after hospital admission. HAP is the leading cause of death due to nosocomial infection with mortality rates ranging from 20% to 50%. Those at highest risk of morbidity and mortality from HAP are critically ill patients. In 2005, guidelines for use in the initial evaluation and management of adult patients in whom HAP is suspected were developed. Because bacteriology varies among hospitals, the guidelines recommend considering local microbiologic data when adapting treatment recommendations for any specific setting(s).
PURPOSE/GOAL: To evaluate the local ecology of bacterial pneumonia experienced in patients admitted to an intensive care unit (ICU) at Borgess Medical Center and establish a relationship between the time of onset of pneumonia (early verse late) and associated microorganisms.
METHODS: This is a single center observational study. All patients greater than 18 years of age admitted into any one of our four intensive care units between November 2006 and March 2007 who meet inclusion criteria will be analyzed. Once a patient is identified as having HAP, the pneumonia will be classified as early or late onset. The microorganisms that are cultured out for each pneumonia case will be evaluated in hopes to establish a pattern of specific organisms in relation to pneumonia onset time for Borgess Medical Center. The empiric antibiotics started for the pneumonias will also be recorded and an evaluation will be made to assess the appropriateness of that antibiotic according to the pneumonia guidelines.
RESULTS/CONCLUSION: Data collection is in process. Results and conclusions of the study will be presented at the Great Lakes Residency Conference.

Learning Objectives:

Differentiate between early verse late onset hospital-acquired pneumonia.

Describe guideline specific treatment recommendations for hospital-acquired pneumonia.

Self Assessment Questions:

Early onset hospital-acquired pneumonia occurs within the first 4 days of hospitalization and is more likely to be caused by multidrug-resistant bacteria. T/F

An example of an appropriate empiric therapy option for early onset hospital-acquired pneumonia is: imipenem plus levofloxacin. T/F

THE EVALUATION OF METABOLIC COMPLICATIONS IN HIV-INFECTED LATINO PATIENTS RECEIVING ANTIRETROVIRAL THERAPY

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Background and purpose:
Metabolic syndromes associated with highly active antiretroviral therapy (HAART) have been well described in the literature. A constellation of abnormalities such as insulin resistance, impaired glucose tolerance, diabetes mellitus, dyslipidemias, and somatic manifestations such as lipodystrophy and lipoatrophy have been documented in relationship with different antiretroviral classes. The Latino population has been underrepresented in the studies that describe these toxicities. In some cases none were included. Large national reports by the Centers for Disease Control and Prevention have shown that Latinos experience a greater incidence of metabolic abnormalities and metabolic syndrome as defined by the ATP III report. It is not known whether Latinos, who are already at risk, are at even greater risk of developing metabolic syndrome in the presence of HAART, and to our knowledge no study has looked at the incidence of HAART-associated metabolic complications in the Latino population. The purpose of this study is to determine the incidence of metabolic complications in HIV-infected, Latino subjects receiving HAART and contrast this to National reports for non HIV-infected Latinos.

Methods:
The study will be a retrospective chart review evaluating antiretroviral safety and metabolic complications including diabetes mellitus, dyslipidemias, lipodystrophy and lipoatrophy in Latino HIV-infected subjects on HAART who received their care at UIMCC HIV Clinic, and are included in a clinical database from January 1st, 2000 to December 31st, 2005. Sample size and justification of Latinos subjects is exploratory in this chart review. A total of 210 subjects have been identified from the existing clinical database for study entry. Results will be analyzed and presented at the Great Lakes Residency Conference.

Learning Objectives:

List potential long-term metabolic complications of antiretroviral therapy

Discuss potential mechanisms of metabolic toxicity of antiretroviral therapy

Self Assessment Questions:

Caucasians are a racial group of the general population with greatest incidence of metabolic complications
TrueFalse

Protease inhibitors are generally associated with lipoatrophy of subcutaneous fat
TrueFalse

HMG-COA REDUCTASE INHIBITORS IN COMBINATION WITH GEMFIBROZIL ASSESSING THE EFFECT OF DOSE LIMITATION GUIDELINES AT A VETERAN HOSPITAL

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Purpose: The use of a fibrate, particularly gemfibrozil, in conjunction with a statin may increase the rate of myopathy and rhabdomyolysis. Combining statins with other drugs that may interact and increase the risk of rhabdomyolysis is also a concern when prescribing these cholesterol lowering drugs. A summary of guidelines established by the Louis Stokes VAMC (LSVAMC) Pharmacy and Therapeutics committee on the combination of statins and fibrates was published locally in February 2006. This summary included statin dosages that should not be exceeded when used in combination with gemfibrozil.

Methodology: A retrospective chart review of a random sample of 10% of all patients with an active order for a statin and gemfibrozil on 1/13/2006 were included. The following data were collected: age, gender, primary care location, name and dose of statin, name and dose of fibrate, creatinine clearance, other drugs interacting with the statin being prescribed, initiating prescriber specialty and location (of statin, fibrate, and other interacting drug), and whether the patient was being managed by a pharmacist-run lipid clinic during initiation of the interacting drug. Other interacting drugs and statin dose thresholds were established by consulting several references, including manufacturer recommendations, drug references, published literature, and pharmacokinetic data. Descriptive data analysis included assessment of: 1) the total number of patients on a statin at a dose exceeding the established threshold when used with gemfibrozil or another interacting drug, and 2) the average dose of the statin being prescribed concurrently with gemfibrozil or fenofibrate.

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

Learning Objectives:

Describe medications that interact with statins and identify dose limitations for each of the statins when combined with each of these interacting drugs

Identify if statins are being used in combination with gemfibrozil according to guidelines recommended by the Pharmacy & Therapeutics committee at the LSVAMC

Self Assessment Questions:

The majority of drug interactions with statins are through inhibition of which cytochrome P450 enzyme?

LSVAMC adhered to statin dose thresholds when combined with gemfibrozil.
a.True
b.False

RETROSPECTIVE ANALYSIS OF WEIGHT BASED DOSING OF RASBURICASE IN ADULT CANCER PATIENTS WITH TUMOR LYSIS SYNDROME

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PURPOSE:
Due to increase in utilization of rasburicase for tumor lysis syndrome (TLS) and lack of adult dosing guidelines, our goal was to characterize rasburicase use at our hospital. In conducting this retrospective chart review, our primary objective is to determine if there is a common weight-based dose used in single-dose rasburicase regimen for TLS associated hyperuricemia in adults. Secondary objectives were to evaluate the efficacy of single dose rasburicase in reducing serum urate levels, and the prescribing criteria for rasburicase based on patient's risk for TLS. We believe that this retrospective chart review will aid the development of guidelines for use of rasburicase in adult patients with TLS associated hyperuricemia. Once implemented, we postulate that these guidelines may result in reduction of health care costs by decreasing need for hemodialysis and reducing hospitalization rates in this patient population.

METHODS:
All adult patients who received a single dose of rasburicase from July 2002 to November 2006, and had urate levels measured both pre- and post-treatment were included in the analysis. If a patient received multiple doses of rasburicase, only lab values obtained prior to the second dose were taken into consideration.

RESULTS:
After reviewing the medical records, twenty-three patients were included in our study. We collected data for twenty six instances of rasburicase administered as a single-dose for analysis. Rasburicase was administered in dose range that extended from 0.08 to 0.22 mg/kg. Two patients required hemodialysis despite rasburicase administration. Only four patients had instructions on appropriate handling of blood samples collected for uric acid analysis after rasburicase administration. One patient was tested for glucose-6-phosphate dehydrogenase deficiency. Additional results shall be presented.

CONCLUSIONS:
Conclusions of this study shall be presented.

Learning Objectives:

To discuss the rationale for rasburicase use in patients with tumor lysis syndrome associated hyperuricemia.

To evaluate efficacy of single dose rasburicase regimen for urate reduction and preservation of renal function in patients with tumor lysis syndrome associated hyperuricemia.

Self Assessment Questions:

TRUE/FALSE: Rasburicase is a xanthine oxidase inhibitor and is useful as an alternative therapy for patients that cannot tolerate allopurinol.

TRUE/FALSE: Rasburicase works ex-vivo so it is important to implement instructions on appropriate handling of blood samples collected for uric acid analysis after rasburicase administration.

STANDARDIZING ONCOLOGY PRE-PRINTED ORDER SETS (PPO'S) AND ATTAINING SYSTEM-WIDE ACCEPTANCE OF THEIR USE WITHIN A HEALTHCARE SYSTEM

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The Institute for Safe Medication Practices (ISMP) and ASHP recommend pre-printed order sets (PPO's) for chemotherapy ordering. Standardized PPO's reduce medication errors by being more complete, consistent, and uniform in format. Current oncology PPO's at Aurora Healthcare have variations in their cisplatin hydration and MESNA dosing protocols. Slight variations between order sets confuse medical staff and are not conducive to future computerized physician order entry (CPOE). Aurora also does not have consistent use of PPO's at all facilities. Some physicians continue to handwrite orders, which are prone to omissions, illegibility, and errors.

Purpose: To standardize Aurora oncology PPO's with consistent cisplatin hydration and MESNA dosing, and to educate offsite locations on the benefits of PPO's to facilitate their use system-wide.

Methodology: A literature review was completed and well-regarded oncology institutions were contacted to collect information about usage of PPO's for error reduction, cisplatin hydration guidelines, and MESNA dosing with ifosfamide and cyclophosphamide. A small chart review was performed on fifteen patients given cisplatin to identify hydration schedules used and their effects on kidney function and electrolytes. This information was utilized to develop standard protocols, and was presented at oncology system-wide meetings. Once approved, all PPO's were updated and made available on-line. Educational presentations were given to system-wide nursing supervisors, describing the benefits of PPOs and how to access them on-line. Education has continued with staff and physicians through meetings and written correspondence. Verbal communication and surveys will be utilized to assess the system-wide usage rate of PPO's at baseline and at project completion.

Conclusions: Standard guidelines for cisplatin hydration and MESNA dosing were developed, approved by all oncology disciplines, and will be made available on-line for system-wide use. Offsite oncology clinics were educated about safety advantages with PPO's and made progress towards implementing their use into daily practice.

Learning Objectives:

Utilize literature and guidelines to standardize MESNA dosing and cisplatin hydration schedules within oncology PPO's.

State the rationale for PPO's with chemotherapy ordering and methods to gain acceptance for use within daily practice.

Self Assessment Questions:

True/False: Standardized pre-printed order sets will make the conversion to CPOE more difficult at Aurora.

True/False: Pre-printed orders are created using evidence based medicine and help reduce chemotherapy ordering errors by being more complete, consistent, and uniform in format.

ASSESSMENT AND REVISION OF A PHARMACY PRACTICE RESIDENCY PROGRAM TO COMPLY WITH THE AMERICAN SOCIETY OF HEALTH-SYSTEM PHARMACISTS (ASHP) 2007 ACCREDITATION STANDARDS

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Purpose
Within a given residency program there is considerable consistency, however, this often dose not carry across practice settings; ASHP, therefore, provides standard criteria that every program must meet in order to receive and uphold accreditation. The most recent change in the ASHP accreditation standards was announced in late 2005 to go into effect in January, 2007. The objective for this project is to systematically analyze and modify Aurora Health Care's existing ASHP-accredited Pharmacy Practice Residency Program so that it is fully compliant with the 2007 ASHP standards for accreditation.

Methods
A gap analysis will be performed to determine the compliance and identify changes that need to be made to Aurora Health Care's Pharmacy Practice Residency program in order to ensure full compliance with all aspects of the revised 2007 ASHP standards for accreditation. The preceptor group will be educated on the new accreditation standards and the identified changes to the Pharmacy Practice Residency Program. An action plan will be developed to address the needed changes to the program. These changes will then be communicated to the preceptor group for their input into the proposed action plan. The identified changes, listed in the finalized action plan, will then be implemented. Feedback will then be solicited from the preceptor group on the implemented action plan. Any further changes will be identified, revised and implemented. Finally, the gap analysis will be revised to describe all of the actions implemented addressing how each gap has been eliminated.

Results
A gap analysis was performed, preceptor education sessions were held, and areas of needed changes were identified and addressed.

Conclusion
Aurora Health Care will have a PGY1 Residency Program that is fully compliant with the ASHP 2007 standards for accreditation.

Learning Objectives:

Describe Aurora Health Care's PGY1 Pharmacy Practice Residency's baseline compliance with the ASHP 2007 accreditation standards.

List 2 areas that may need to be addressed in order to assure full compliance with the ASHP 2007 standards for accreditation.

Self Assessment Questions:

True/False: The goal of new accreditation standards is to implement uniform outcomes, goals and objectives between programs

True/False: Within a given residency program there is considerable consistency, however, this often dose not carry across practice settings.

ANALYSIS OF CORTICOSTEROID USE IN PATIENTS WITH SEPSIS ADMITTED TO AN URBAN ACADEMIC MEDICAL CENTER

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Preliminary evidence suggests that septic shock patients with relative adrenal insufficiency (RAI) treated with corticosteroids have decreased mortality compared to those not treated with corticosteroids. A cosyntropin stimulation test is commonly used for the diagnosis and management (i.e., decision to use corticosteroids) of RAI in patients with septic shock. The purpose of this study is to analyze the use of the cosyntropin stimulation test in septic shock patients admitted to a tertiary care medical center. The secondary objective of this study is to determine patient outcomes associated with the decision to treat or not to treat with corticosteroids.

Records of patients admitted to The University Hospital between September 1, 2005 and September 1, 2006 who received vasopressor medications were identified. These patients were cross-referenced with a database of hydrocortisone charges. Two cohorts were established: (1) patients who received vasopressor medications and hydrocortisone and (2) patients who received vasopressor medications but did not receive hydrocortisone. A chart review was undertaken to ensure a diagnosis of septic shock defined as documented or suspected infection and requirement of vasopressor therapy in the presence of derangements in two out of three of the following: temperature, heart rate and WBC count. Each cohort is being evaluated to determine whether (1) a cosyntropin stimulation test was performed and the nature of the response accordingly; (2) random cortisol levels were evaluated; or (3) no cortisol studies were performed. Patient demographics and other outcome parameter information are being collected. Primary patient outcomes are in-hospital mortality, and hospital and intensive care unit lengths of stay. Corticosteroid dosage, duration of therapy, and the method used for cessation of steroid treatment (e.g., taper) are also being evaluated. Descriptive statistics will be employed to analyze the data. Data collection is currently in progress, and the analysis of results is pending.

Learning Objectives:

Describe the different methods used to test for relative adrenal insufficiency in patients with septic shock.

List the strategies recommended for the Surviving Sepsis Guidelines for use of steroids in patients with septic shock.

Self Assessment Questions:

True or False: All patients with septic shock benefit from administration of steroid therapy.

Which of the following may be used to test for relative adrenal insufficiency in septic shock patients:
a.A 250 microgram cosyntropin stimulation test
b.A 1 microgram cosyntropin stimulation test
c.A random cortisol level
d.All of the above

EVALUATION OF COMMUNITY-ACQUIRED METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS IN HEALTHY PEDIATRIC SKIN AND SOFT-TISSUE INFECTIONS: AN EMPIRIC TREATMENT AND DECOLONIZATION PROTOCOL DEVELOPMENT STUDY

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BACKGROUND/PURPOSE- The incidence of community-acquired methicillin-resistant Staphylococcus aureus (CA-MRSA) skin and soft tissue infections (SSTIs) has been on the rise across the nation. Recent studies have reported a large increase in resistance rates to commonly used antibiotic agents, demonstrating the need to evaluate antibiotic susceptibility patterns within our own institution. The primary objective of this study is to determine the percent of cultured CA-MRSA SSTIs seen in the Pediatric Emergency Room (PedsER) at Saint Joseph Mercy Hospital, and determine the antibiotic susceptibility profile of CA-MRSA. We will also develop an appropriate empiric treatment and decolonization protocol.

METHODOLOGY- In this retrospective study, we will obtain patient data from electronic medical charts and culture results from the laboratory database. Patients admitted or seen by the Pediatric Service, between January 2004 to December 2006, who presented with a SSTI and had wound cultures drawn will be included in this study. This study will exclude patients who may be at risk or who have a known hospital-acquired methicillin-resistant Staphylococcus aureus infection, or who had cultures obtained 48hr after admission. We will evaluate the percent of these wound infections due to CA-MRSA compared to other organisms. We will evaluate antibiotic susceptibilities and report the clindamycin resistance changes over the last three years at our institution. This data will be used to develop and implement a treatment protocol for use in the PedsER and Pediatric Service. Data analysis for this study will be preformed using the test of trends to compare change in resistance each year, chi-squared test for categorical data, and student t-test for continuous data.

RESULTS/CONCLUSIONS: Data collection is in progress. Results and conclusions will be discussed at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Characterize resistance trends in CA-MRSA.

Identify appropriate empiric treatment and decolonization options for CA-MRSA.

Self Assessment Questions:

TRUE or FALSE: Community-acquired MRSA is predominantly associated with skin and soft tissue infections.

Which of the following is NOT appropriate for empiric treatment of CA-MRSA?
a. Trimethoprim/Sulfamethoxazole
b. Linezolid
c. Ciprofloxicin
d. Clindamycin

IMPLEMENTION AND IMPACT OF CLINICAL PHARMACY SERVICE IN AN OUTPATIENT HEMODIALYSIS CLINIC

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Background/Purpose: Patients with end stage renal disease (ESRD) on chronic hemodialysis (HD) have complex medication regimens, averaging about twelve medications per patient. These patients are at high risk for developing drug-related problems because they require multiple medications for their existing renal disease while treating concurrent medical conditions. Frequent drug monitoring is required to ensure optimal treatment for these patients. As a result, many of these patients' medication doses change frequently. This in turn may result in both lack of patient education and poor compliance. Literature supports positive outcomes when pharmacists are involved in clinical pharmacy services in patients with ESRD. The purpose of this project is to develop, implement and measure the impact of a new pharmacy service in an outpatient hemodialysis clinic.

Methods: The pharmacist will conduct a medication profile review with each patient while they are receiving HD. When the pharmacist identifies drug-related problems, e.g. drug interaction, adverse reaction, overdose, medication reconciliation, he/she will make appropriate interventions and record the outcomes of the interventions. The interventions will be categorized according to the drug(s) involved and the types of intervention outcomes. Examples of these intervention outcomes include changes in frequency of administration, initiation or discontinuation of drug therapy, or drug information provided to clinicians and/or patients. The pharmacist will also assist and be involved with bi-weekly laboratory monitoring and make appropriate recommendations to the healthcare team.

Results and conclusion: Data analysis, results and conclusion will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Describe the pharmacist's role in providing pharmaceutical care in patients with ESRD requiring multiple medications.

List the most common types of drug-related problems identified and resolved among ESRD patient population.

Self Assessment Questions:

Which of the following are risk factors for patients with ESRD developing medication-related problems?
a)Multiple medications and lack of education
b)Concurrent disease states
c)Frequent monitoring and dosage changes
d)All of the above

What are the ways pharmacists can be involved in a hemodialysis clinic besides direct patient care?

RETROSPECTIVE EVALUATION OF CLOPIDOGREL USE IN A VETERANS AFFAIRS POPULATION AFTER IMPLEMENTATION OF NATIONAL CRITERIA FOR USE

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Purpose:
In January 2005, the Veterans Health Administration released national criteria for use of clopidogrel in veteran patients. Supported by evidence-based medicine, the criteria include recommendations for clopidogrel use in the areas of cardiology, neurology, and vascular disease.
The primary objective of this study is to evaluate clopidogrel use in veteran patients after implementation of the criteria. The evaluation focuses on clopidogrel indication, treatment duration, incidence of adverse cardiovascular events, and bleeding complications.
The secondary objective is to evaluate the incidence of secondary adverse cardiovascular events in patients whose clopidogrel was discontinued in accordance with the criteria.

Methods:
To evaluate the primary objective, a chart review is being conducted on 291 (10%) patients with active clopidogrel prescriptions between June 2005 and May 2006. Data collected includes patient demographics, clopidogrel indication, treatment duration, cardiovascular and bleeding events during treatment, and use of concurrent anticoagulation medications.
To evaluate the secondary objective, a chart review was completed for 260 patients with an active clopidogrel prescription between January and December 2004 to determine rates of discontinuation. Data collected included reason for discontinuation and adverse cardiovascular events after clopidogrel discontinuation.

Preliminary Results:
Preliminary results are available on 25 patients evaluated for the primary objective. The average age was 73, 96% were male and 72% were Caucasian. Duration of clopidogrel therapy averaged 32 months, ranging 1 - 78 months. Adverse bleeding events occurred in 15% of patients, and 28% of patients had a cardiovascular event. Percutaneous coronary intervention was the most common indication for use in 27% of patients.
Of the 260 patients evaluated for the secondary objective, clopidogrel was discontinued in 63% of patients after implementation of the criteria. In patients whose clopidogrel was discontinued, 4% experienced a cardiovascular event.

Conclusions reached:
Conclusions will be presented at the Great Lakes Conference pending completion of data collection.

Learning Objectives:

For various indications, compare and contrast the evidence-based recommended duration of clopidogrel use with the average duration of clopidogrel therapy used in clinical practice

Determine the incidence of adverse of cardiovascular events in patients whose clopidogrel therapy is maintained or discontinued in accordance with evidence-based recommended durations of use

Self Assessment Questions:

True or False: Optimal duration of clopidogrel administration in patients with drug-eluting stents has been determined by a large-scale randomized clinical trial

True or False: Results from the CHARISMA trial suggested that clopidogrel plus aspirin was not significantly more effective than aspirin alone in reducing the rate of myocardial infarction, stroke, or death from cardiovascular causes in all patients at high risk for atherothrombotic events

THE RISK OF CLOSTRIDIUM DIFFICILE DISEASE ASSOCIATED WITH CONCURRENT USE OF PROTON PUMP INHIBITORS

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Purpose:
Clostridium difficile is a bacteria commonly associated with infections in the hospital setting. Toxigenic strains of the organism, immune system dysfunction, comorbid illnesses, advanced age, and medications that will suppress gastric acid may potentially put patients at risk for contracting C. difficile. Proton pump inhibitors (PPIs) are agents that decrease gastric acidity and may increase a patient's risk of being colonized with C. difficile. The primary objective of this study is to determine if the use of proton pump inhibitors (PPIs) increase the risk of C. difficile infection in hospitalized patients.

Methods:
This study will be a retrospective, case-control study at a large hospital in Mayfield Heights, Ohio. All patients (age 18-89) with positive C. difficile toxins from 2003-2005 will be identified through utilization of the regional laboratory result system. Patients that received a PPI from 2003-2005 will be identified through a pharmacy billing system. A chart review will determine any correlation between the use of PPIs and additional risk factors in all patients identified with C. difficile infection. Statistical analyses will be performed to determine the odds ratio between patients with C. difficile infection and concurrent use of PPIs. Demographic data collected will include: age, weight, height, sex, and prior place of residence. Additional data collected will include: admission diagnosis, comorbid illnesses, white blood cell count, type and duration of both total antibiotics exposure and PPI exposure. This study has been approved by the Cleveland Clinic Health System Investigational Review Board.

Results/Conclusion:
Data collection is in progress. Analysis of the results will be addressed at the Great Lakes Pharmacy Practice Conference.

Learning Objectives:

Review the prevalence and importance of Clostridium difficile infections in the hospital setting.

Develop an understanding of how proton pump inhibitors put patients at risk for Clostridium difficile.

Self Assessment Questions:

True or False Clostridium difficile infections result in longer patient hospital stays.

True or False Proton pump inhibitors decrease gastric pH which can promote bacterial growth.

EVALUATION OF A PHARMACY IMPLEMENTED MEDICATION RECONCILIATION STRATEGY DIRECTED AT ANTI-RETROVIRAL THERAPY IN HIV/AIDS PATIENTS ADMITTED TO AN ACADEMIC MEDICAL CENTER

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BACKGROUND: Anti-retroviral therapy for Human Immunodeficiency Virus (HIV) is commonly associated with medication errors in hospitals due to dosing, complex regimens, and unfamiliarity with anti-retroviral therapy. METHODS: This is a prospective analysis investigating the effect of pharmacist driven medication reconciliation of HIV therapy in all HIV positive patients who are currently taking anti-retroviral therapy between October 2006 and April 2007 at Rush University Medical Center (RUMC). Baseline data consists of assessment of the current nursing-driven process 48 hours after admission. The pharmacist-driven process will consist of pharmacist review of the anti-retroviral therapy for accordance with the published guidelines, interactions, proper dosing, and opportunistic infection prophylaxis within 24 hours of admission. Appropriateness will be defined as therapy in accordance with the published guidelines, proper dosing of the regimen, and the avoidance of potential drug interactions with medications started in the hospital. The primary outcome to be analyzed is the appropriateness of HIV therapy 48 hours after admission for both medication reconciliation processes. PRELIMINARY RESULTS/CONCLUSIONS: Sixteen patients have been enrolled in the baseline analysis and eight of the patient regimens had medication errors. Nine total errors occurred. One patient regimen involved two errors. Two errors involved each of the following: opportunistic infection treatment, drug interactions, and medications omitted from the regimen. One error involved the dosage form, 1 involved dosing time, and 1 involved dosing frequency. Of the 9 recommendations made, all were accepted by the physicians. From preliminary analysis, 50% of all regimens required pharmacist intervention to optimize therapy. This demonstrates a need for an improvement in the current nursing-driven process. The benefit of a pharmacist-driven medication reconciliation process will be accessed in the final analysis.

Learning Objectives:

1. Identify the importance of accurate medication reconciliation in HIV/AIDS patients in an academic medical center.

2. Discuss the potential role of a pharmacist in the transition of an HIV/AIDS patient from the outpatient to inpatient setting.

Self Assessment Questions:

1. 1.What are the key areas where medication errors in anti-retroviral therapy can occur?
a. Opportunistic infection prophylaxis/treatment
b. Drug interactions
c. Dosing
d. All of the above

2. What are the outcomes that can occur with missed doses, improper dosing, or other errors made when restarting anti-retrovirals?
a. Inadequate viral suppression
b. Suboptimal therapy
c. Possible virus resistance
d. All of the above

PHARMACIST INTERVENTIONS TO IMPROVE ADHERENCE AMONG HIV-1 INFECTED ANTIRETROVIRAL-NAVE PATIENTS

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Purpose: The purpose of this study is to determine if continued follow-up with treatment-nave patients after initiating antiretroviral therapy improves adherence. It is anticipated that increased contact with patients will lead to improved adherence, which will result in greater viral suppression.

Methods: All adult HIV-1 infected antiretroviral-nave patients who begin antiretroviral therapy attend an initial medication teaching appointment with the clinical pharmacist. Patients were asked to participate in the study during these appointments. After beginning antiretroviral medications, a pharmacist contacted patients via telephone on five occasions and interviewed patients during clinic-based appointments on four occasions, according to a predetermined schedule. These encounters included assessments of adherence, adverse effects, and other barriers to adherence, as well as suggestions for improving adherence. At the final appointment, patients were asked to answer several questions regarding whether this increased contact with a pharmacist was beneficial. Adherence was measured by patient self-reports, pharmacy records of refill history, and HIV-1 RNA, which was measured in all patients as part of their routine care. Adherence and HIV-1 RNA for patients in the intervention group were compared with patients who began antiretroviral therapy within the last six months but who did not receive additional follow-up adherence interventions.

Results: Patients are currently being enrolled in this study. Data collection is in the initial stages; therefore results are not yet available.

Conclusions: To be presented pending completion of data collection and analysis.

Learning Objectives:

Explain the importance of adherence to antiretroviral therapy, and how to predict poor adherence.

Describe the role of the pharmacist in helping improve adherence in the HIV positive population.

Self Assessment Questions:

List two methods of measuring adherence, and the pros and cons of each method.

Explain the interventions a pharmacist can make to help improve adherence in this patient population.

INTRAVENOUS BISPHOSPHONATE USE LONGER THAN 21 MONTHS FOR THE PREVENTION OF SKELETAL COMPLICATIONS IN PATIENTS WITH CANCER.

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Purpose: When intravenous bisphosphonates were approved by the FDA for use in patients with cancer, the literature showed continued reduction of skeletal complications up to 21 months after the initiation of therapy. At that time, the risk of continued therapy was low compared with the benefit, but recent data suggest that prolonged therapy may place patients at an increased risk for osteonecrosis of the jaw (ONJ). The objective of this study is to evaluate the incidence of skeletal complications when therapy with intravenous bisphosphonates is continued for longer than 21 months.

Methodology: The health system's electronic medical record system was used to identify all patients who are diagnosed with multiple myeloma, and metastatic breast, prostate, or lung cancer who received more than 21 months of zoledronic acid, pamidronate, or both. A retrospective chart review was then conducted for all patients identified between January 2001 and September 2006. The primary outcome was diagnosis of at least one skeletal related event defined as pathologic fracture, spinal cord compression, radiotherapy to bone, or surgery to bone. The following data was also collected for the patients who are identified: age, gender, malignancy and extent of disease (bone involvement), indication for bisphosphonate therapy, bisphosphonates received, duration of therapy, number of doses received, reason for discontinuation, new diagnosis of skeletal complication, and diagnosis of ONJ. Data analysis will be performed using descriptive statistics. This study was approved by the Institutional Review Board.

Results/Conclusions: Data collection is in progress. Results and conclusions of the study will be presented at the conference.

Learning Objectives:

Discuss the duration of bisphosphonate therapy currently supported by literature for the prevention of skeletal related events in patients with cancer.

Discuss ONJ as a clinically significant adverse event related to the use of intravenous bisphosphonate therapy.

Self Assessment Questions:

There are clinically significant data at this time to support the use of bisphosphonates for longer than 21 months for the prevention of skeletal complications in patients with cancer? T/F

The estimated incidence of ONJ related to intravenous bisphosphonate use is approximately 5-10% T/F

PATIENT EXPERIENCE WITH EMERGENCY CONTRACEPTION

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Unintended pregnancy in the US continues to rise at an alarming rate such that increasing awareness and understanding of emergency contraception (EC) may help to decrease the number of unplanned pregnancies. The objective of this study is to evaluate patient experience with progestin only EC and how this correlates to outcomes, which include: availability of emergency contraception, patient understanding of proper dosage administration, adverse effects, and overall pregnancy rate.

Three groups of participants will be enrolled in the study: (1) women who present to the Center for Women's Health or Family Medicine Center at the University of Illinois Medical Center at Chicago (UIMCC) who receive an EC prescription for immediate use; (2) women who obtain an advance provision prescription for EC from either of the above clinics; and (3) women who present to purchase EC over-the-counter at a UIMCC pharmacy. Subjects = 18 years of age and currently not smoking at the time of enrollment will be recruited. All enrolled subjects who receive EC will also be given an educational leaflet discussing proper use. A follow-up telephone survey will be given within 3 to 4 weeks for subjects who receive EC for immediate use and within 3 to 6 months for those who received an advance provision prescription. Survey questionnaires will assess the following: availability of EC, time and date of use, how EC was administered, any alterations in menstrual cycle, use and results of pregnancy tests post EC, adverse effects, plans for contraception in the future, and a brief assessment of patient understanding and retention of the educational leaflet provided. Data will be evaluated to assess patient understanding of proper use of EC, incidence and characterization of adverse effects, and the overall rate of unintended pregnancies.

Results and conclusions will be presented at Great Lakes Regional Residency Conference.

Learning Objectives:

Determine the importance of a pharmacist's role in educating patients about emergency contraception.

Evaluate the incidence of adverse effects of progestin EC, patient understanding about proper timing and use of EC and the overall rate of unintended pregnancies.

Self Assessment Questions:

Patients receiving progestin only EC can take 2 pills at the same time up to 120 hours after unprotected intercourse. T/F

It is important to properly counsel patients that emergency contraception is not a replacement for regular contraception. T/F

THE CONTRIBUTION OF A ROUNDING PHARMACIST TO THE DRUG THERAPY KNOWLEDGE OF MEDICAL RESIDENTS

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Background and Purpose: Although various studies have demonstrated the benefits of having a clinical pharmacist participate on medical rounds, none have explored the role of the rounding pharmacist on resident education. It is the goal of this study to evaluate whether participation of a clinical pharmacist on a rounding team helps improves medical resident's pharmacotherapy knowledge.

Methods: The study will utilize a two-group pre-test post-test design. The drug therapy knowledge of medical residents rounding with a clinical pharmacist will be compared to residents on a similar service that do not have a rounding clinical pharmacist. The effect of a rounding pharmacist on resident education will be assessed by comparing the change in results of a test assessing drug therapy knowledge before and after completion of a 4-week clinical rotation. A 50-question test about pharmacotherapy was created based on questions from the United States Medical Licensing Exam (USMLE) and the APhA review for pharmacy. Questions pertaining to infectious disease, cardiology and internal medicine were included in the tests. Two pharmacy specialists and a physician reviewed the questions for quality improvement purposes. Content validation was accomplished by administering the tests pharmacy students, practicing pharmacists, and chief medical residents that would not be participating in this study. Based on content validation some test questions were either revised or excluded. Data collection is currently being conducted to assess if any differences between the two groups exist.

Results: Results of this study will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Evaluate whether the participation of a clinical pharmacist on medical rounds helps improve medical residents and students' pharmacotherapy knowledge.

Discuss the impact of having a clinical pharmacist participating on medical rounds and whether the presence of having or not having a pharmacist changes medical residents and students' perception of pharmacists.

Self Assessment Questions:

True or False: Previous studies have demonstrated that the participation of a clinical pharmacist during rounds helps improve medical residents pharmacotherapy knowledge

True or False: A decrease in preventable adverse drug events has been shown when a pharmacist was available during medical rounds.

MEDICATION USE EVALUATION COMPARING BOTH ADVERSE DRUG REACTION EVENTS AND EFFICACY OF HIGH DOSE ROSUVASTATIN TO HIGH DOSE ATORVASTATIN IN A VETERAN POPULATION

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OBJECTIVE: The most recent National Cholesterol Education Program Adult Treatment Panel III report recommended that practitioners consider more intensive lowering of low density lipoprotein (LDL-c) beyond previously set goals for high risk patients. In order to achieve intensified LDL-c goals, higher doses of high potency statins are often required. Statins in general are very well tolerated; however there tends to be a dose related increase in risk for toxicity and adverse drug events. The objective of this study is to evaluate confirmed adverse drug events and efficacy of LDL-c lowering of high dose rosuvastatin to high dose atorvastatin in a veteran population.

METHODS: A search of the pharmacy prescription database at the William S. Middleton VA Hospital will be conducted to identify all patients receiving rosuvastatin 40mg from September 1st 2005 to September 1st 2006 and atorvastatin 80mg from January 1st 2004 to July 1st 2004. The VA Computerized Patient Record System (CPRS) will be used to collect the following data prior to and throughout treatment with rosuvastatin and atorvastatin: fasting lipid panel, liver function tests, concurrent lipid medications, active medication list, co-morbidities, refill histories, adverse events, cardiovascular events, cerebrovascular events, and heart failure. The primary outcome is to determine the safety of both rosuvastatin 40mg and atorvastatin 80mg, alone or in combination with other lipid lowering therapies, in terms of confirmed adverse events. Adverse events include confirmed cases of proteinuria, elevated LFTs, elevated CPK, rhabdomyolysis, acute renal failure, and hematuria. The secondary outcome will include effectiveness of rosuvastatin 40mg to atorvastatin 80mg, alone or in combination with other lipid-lowering agents, in achieving LDL-c goals as well as total cholesterol, triglycerides, and high density lipoprotein (HDL). Other outcomes will include prevention rates of cardiovascular events, cerebrovascular events, and heart failure.

RESULTS/CONCLUSIONS: To be presented at the conference.

Learning Objectives:

Compare and contrast atorvastatin and rosuvastatin in terms of metabolism.

Compare and contrast atorvastatin and rosuvastatin in terms of efficacy

Self Assessment Questions:

Which statin has more drug interactions due to metabolism?
a) atorvastatin
b) rosuvastatin
c) no drug interactions for either of them
d) they are about the same

Which statin(s) have maximum LDL-c lowering greater than or equal to 60%?

SAFETY OF INTRAVENOUS KETOROLAC USE IN INFANTS FOLLOWING CARDIOTHORACIC SURGERY

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Purpose: The use of intravenous ketorolac in infants less than six months of age is increasing in post-operative cardiothoracic patients at Cincinnati Children's Hospital Medical Center (CCHMC). However, there is a paucity of data related to the use of intravenous ketorolac in infants less than six months of age. This study is designed to compare the safety of intravenous ketorolac use in a study group versus a control group in infants less than six months of age undergoing cardiothoracic surgery. This study will review the experience with intravenous ketorolac in infants to develop recommendations for its use in post-operative cardiothoracic patients.

The primary endpoint of the study is to measure the frequency of renal impairment and hematological complications in patients less than six months of age who received ketorolac following cardiothoracic surgery.

Methods: A retrospective chart review was conducted on patients admitted to the Cardiac Intensive Care Unit (CICU) and Cardiac Stepdown Unit who underwent cardiothoracic surgery between August 1, 2004 and August 31, 2006. This study compared the use of intravenous ketorolac in cardiothoracic patients less than six months of age following surgery to those patients who received standard pain management post-operatively. Patients undergoing single ventricle staged palliation, having an allergy to ketorolac or aspirin, and/or abnormal renal and hematological baseline values were excluded. Data collected included patient demographics, total ketorolac exposure, medication use throughout hospitalization, blood product administration, incidence of renal impairment and incidence of hematological complications.

Results/Conclusion:
Data analysis is currently ongoing. A total of 63 patients were evaluated (35 control group and 28 study group). The results and conclusions of this study will be presented at Great Lakes Conference.

Learning Objectives:

Discuss the incidence of renal impairment in post-operative cardiothoracic surgery patients less than six months of age receiving intravenous ketorolac therapy versus patients not receiving intravenous ketorolac therapy.

Discuss the incidence of hematological complications in post-operative cardiothoracic surgery patients less than six months of age receiving intravenous ketorolac therapy versus patients not receiving intravenous ketorolac therapy.

Self Assessment Questions:

T/F There is an increase in the incidence of renal impairment and hematological complications with the use of intravenous ketorolac use in cardiothoracic patients less than six months of age post-operatively.

T/F Intravenous ketorolac use is appropriate treatment for pain management in infants less than six months of age following cardiothoracic surgery.

SAFETY AND EFFICACY OF A HIGH-INTENSITY, WEIGHT-BASED, INTRAVENOUS HEPARIN PROTOCOL REVISION IN THE OBESE.

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Purpose: Heparin dosing has shifted from an empiric to weight-based protocol, but dosing in obesity has remained problematic. Necessary dosage adjustments to account for obesity vary, remain controversial, and are yet to be validated. Previously collected data within our institution concluded that the initial heparin infusion rate should be adjusted from 18 units/kg/hr to 15 units/kg/hr (based on actual body weight) in patients above 50% ideal body weight, infusion rates should be limited to 2,100 units/hr in all patients, and bolus heparin doses (80 units/kg) should be limited to 10,000 units in all patients. The purpose of this study was to evaluate the safety and efficacy of these adjustments to our high-intensity intravenous (IV) heparin protocol.

Methods: An observational chart review was conducted from the initiation of the revised high-intensity IV heparin protocol (October 2006) through March 1, 2007. All patients receiving high-intensity (aPTT goal 60 - 85 seconds), weight-based heparin dosing were identified through computer reports. Subjects were excluded if they had incomplete documentation or were currently enrolled in a clinical trial. Parameters collected included: patient demographics; heparin dosing; baseline laboratory data (creatinine, hemoglobin, platelet count, INR, and aPTT); follow-up aPTT values; time to reach therapeutic aPTT; adjustments to heparin infusion; adverse events (AEs); and recurrence of venous thromboembolism (VTE). Primary outcome measures consisted of time to reach therapeutic aPTT, follow-up aPTT levels, AEs occurrence, and VTE recurrence. Secondary outcome measures were used to investigate the influence of concomitant disease states (VTE, post-phlebitic syndrome, hepatic cirrhosis, CHF, and ESRD) on weight-based heparin dosing.

Results/Conclusions: Data collection is ongoing. Results will be compared to the previously collected data to validate the dosage adjustments. Final results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Discuss the potential strategies to account for obesity in weight-based heparin dosing.

Describe the safety and efficacy of proactive dosage adjustments to the revised high-intensity IV heparin protocol initiated at TTH/TCH.

Self Assessment Questions:

True or False: The theory behind problematic heparin dosing in obesity rests on research that indicates the relationship between increased body weight and increased heparin dosing is non-linear, due to a decrease in blood volume in adipose versus lean tissue.

Heparin dosage adjustments to account for obesity have included which of the following?
a. Using actual body weight (ABW) without any adjustments.
b. Adjusting the initial infusion rate to 15 units/kg/hr based on ABW.
c. Averaging ABW and ideal body weight (IBW) and using it as a "dosing weight."
d. Adding 40% of the difference between ABW and IBW to the ABW and using it as a "dosing weight."
e. All of the above are correct.

METHADONE USE: A GROWING CONCERN FOR PATIENT SAFETY

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Background: A National Assessment for methadone associated mortalities conducted by the U.S. Department of Health and Human Services revealed an increase trend in deaths with an increase in prescriptions and dispensing patterns. The assessment revealed serious complications including cardiac arrhythmias, respiratory depression, and death from methadone. As a result, the Food and Drug Administration released an alert in November 2006 regarding concerns of methadone use for analgesia. Response to the heightened awareness surrounding the dangers of methadone prompted further evaluation of current literature and prescribing practices at The Ohio State University Medical Center.

Purpose: The purpose of this evaluation is to assess the clinical indications for which methadone was prescribed and quantify prescribing practices. Appropriate actions will be made based on the findings.

Methods: Prior to collecting data, Institutional Review Board (IRB) approval was achieved. A retrospective review of patients receiving methadone therapy from November 2006 - January 2007 via sampling from the pharmacy information systems. The following data will be collected from the medical record: baseline patient information, methadone use indication, and prescribing physician/service. Descriptive statistics will be applied to the sample. Results of the evaluation will be presented to the Pharmacy and Therapeutics committee to consider the potential for prescribing guidelines and restrictions.

Learning Objectives:

Quantify the increased patient risks with the use of methadone by prescribing tendencies and indications.

Make recommendations for actions for other hospitals.

Self Assessment Questions:

Methadone can cause respiratory depression, prolonged QT interval, and/or result in patient deaths. T/F

"Poison cocktail" which may be linked to methadone associated mortalities includes methadone, CNS depressants and other opioids. T/F

ASSESSMENT OF PAIN CONTROL FOLLOWING FASCIA CLOSURE IN LIVER OR LIVER/KIDNEY TRANSPLANT RECIPIENTS

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Background:
In patients undergoing liver transplantation, the current practice at Indiana University Hospital is to delay fascia closure until 48-72 hours following the liver transplantation. Patients undergoing liver transplantation surgeries experience extreme pain and poor pain control following the fascia closure procedure. Patients receive a patient controlled analgesic (PCA) with either morphine or hydromorphone after their procedure. However, this may not provide adequate alleviation of pain for the patient.

Objective:
The purpose of this study is to assess the level of pain control achieved through PCA in post liver or liver/kidney transplant patients following fascia closure.

Methods:
Records of patients who received liver or liver/kidney transplants between June 1, 2006 and December 31, 2006 will be retrospectively reviewed for the 48 hour time period following fascia closure. Patients will be excluded if they underwent fascia closure sooner than 48 hours or longer than 72 hours after transplantation. Patients will also be excluded if they are intubated or otherwise unable to use a PCA or report pain scores following fascia closure. Patients will be included if they have received a liver or liver/kidney combination transplant. Patients with other combinations which include the liver will not be included in this review. Patient pain scores, based on the standard pain scale used by the nursing staff in the transplant program will be collected. Only self reported scores will be reviewed. Scores which are determined observationally by the nurse will be excluded. The amount of narcotic analgesic used during the 48 hour time period will also be documented.

Results:
Data is currently being collected and results will be presented at the conference.

Learning Objectives:

Understand various methods of pain control following transplantation procedures.

Compare and contrast the various risks and benefits to the management of pain in the liver transplant population.

Self Assessment Questions:

PCA is an appropriate method of post-operative pain control in patients undergoing liver or liver/kidney transplants. T/F

What is the reason for delaying fascia closure in liver transplant patients?

IMPACT OF PHARMACISTS DURING RESUSCITATION EVENTS OF CRITICALLY ILL PATIENTS: EVALUATION OF DRUG SELECTION, DOSING AND TIMING.

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Background: Currently, literature supports the presence of pharmacists in multitudes of environments including intensive care units, anticoagulation clinics, and long-term care facilities. Additionally, pharmacists have been shown to provide positive outcomes in critical situations while in the emergency department and as an integral team member in ACLS. Along with this evidence many regulatory organizations now mandate proper and timely administration of medications in the face of myocardial infarction, congestive heart failure, sepsis, and pneumonia. Currently, the selection of medications and dosing are done in the emergency department and ICUs by physicians. However, due to increased training and familiarity, pharmacists may provide quicker drug selection, more accurate dosing, and be able to facilitate quicker medication preparation and administration.

Purpose: In addition to ACLS and disease specific guidelines, we believe that the presence of a specialty trained emergency medicine or critical care pharmacist will provide more accurate drug selection and improved outcomes in potentially critical situations. The primary objective was to compare proper drug selection, dose administered, and time from drug order to administration when a pharmacist is present versus when not present.

Methods: This study was a prospective, randomized, placebo-controlled trial conducted at Detroit Receiving Hospital and Eugene Applebaum College of Pharmacy. The study was comprised of ten parallel groups of emergency medicine residents conducting resuscitation scenarios on a high fidelity simulator. Each simulation was conducted with the presence of a nurse and three residents, all blinded to the case. In the intervention groups, a specialty trained pharmacist, blinded from the case, was allowed to participate as a resuscitation team member, providing drug information including medication selection and dosing. All cases were video taped and reviewed by two independent reviewers scoring for appropriate drug selection, proper dosing, and time to medication administration.

Result and Conclusion: Data and results to be presented.

Learning Objectives:

To understand the impact of a specialty trained pharmacist's presence in the case of critically ill resuscitations.

To evaluate if the placement of a pharmacist on a resuscitation team can increase appropriate medication selection, correct patient specific dosages, and decrease time to administration.

Self Assessment Questions:

Literature supports the addition of a pharmacist to health care teams to decrease medication errors? True or False

Pharmacists can potentially decrease the time required to order and administer an antibiotic requiring renal adjustment? True or False

EFFECT OF GENOTYPING ON TREATMENT OF COLON CANCER: AN ECONOMIC ANALYSIS

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Background: Current practice is evolving toward patient-specific, individualized therapies. One changing practice involves genetic screening to predict response to medication therapy, allowing prospective changes in care in order to increase therapeutic effectiveness and minimize adverse effects and cost.

Objectives: Evaluate outcomes of screening for UGT1A1 for colorectal cancer patients on overall and medication-related cost of therapy.

Methods: We are using decision-analytic techniques to explore the return on investment of genetic testing, including medication and non-medication related therapy costs. Multiple items including cost of chemotherapy regimens and expected dosing/regimen changes following results of genotyping are varied to test sensitivity.

Results: The results of this ongoing analysis will be used to form recommendations for routine screening of patients prior to treatment with irinotecan therapy.

Conclusion: At the conclusion of this study, cost-effective recommendations for the use of this screening test will be provided.

Learning Objectives:

Understand decision-analytic modeling, specifically decision-tree analyses.

Explain the role of genetic screening in guiding therapy and preventing adverse events.

Self Assessment Questions:

What technique is used to account for uncertainty when performing a decision-tree analysis?

What options are considered when a patient exhibits an abnormal genotype related to drug metabolism?

TIME TO ANTIBIOTICS IN PATIENTS WITH SEPSIS BEFORE AND AFTER THE IMPLEMENTATION OF COMPUTERIZED PHYSICIAN ORDER ENTRY

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Background: The Surviving Sepsis Campaign guidelines recommend that intravenous antibiotics should be started within the first hour after a patient is diagnosed with severe sepsis. The empiric antibiotic regimen should cover all organisms suspected.

While computerized physician order entry (CPOE) systems have the potential to prevent medication errors and improve the quality of patient care, little is known about the impact of CPOE on critically ill patients with severe sepsis or septic shock.

Purpose: Evaluate the time to antibiotics and clinical outcomes in all patients with documented bacteremia admitted to the intensive care unit (ICU) before and after the implementation of electronic medical records (EMR) and CPOE.

Methods: This observational study will include a retrospective group (before CPOE was available), and a prospective group (after CPOE). Inclusion criteria are admission to a medical ICU, patients with suspected sepsis given IV antibiotics, and patients with positive blood cultures. Patients will be excluded if they were on antibiotics prior to admission, patients transferred from another health care facility, and patients with more than one episode of bacteremia, sepsis, or septic shock during hospitalization. Data collected includes demographic information, past medical history, APACHE II score, SOFA score, vasopressor therapy, mechanical ventilation, the ratio of the partial pressure of arterial oxygen to the fraction of inspired oxygen, timing and results of microbiologic cultures, in vitro susceptibility to empiric antimicrobial therapy, time to administration of antibiotics, hospital length of stay, ICU length of stay, all-cause and infection-related mortality, and withdrawal of life support/transfer to palliative services.

Results: Data collection is still in progress. Results and conclusions will be presented at the conference.

Learning Objectives:

To evaluate the time to antibiotics for all patients with documented bacteremia admitted to the ICU before and after the implementation of EMR and CPOE.

To discuss the potential impact of CPOE on the clinical outcome of patients with severe sepsis or septic shock admitted to the medical ICU.

Self Assessment Questions:

How soon should antibiotics be started after a patient is diagnosed with sepsis?

Inadequate empiric therapy in patients with sepsis increases mortality rate. T/F

MEDICATION THERAPY MANAGEMENT CLINIC ESTABLISHED WITHIN COMMUNITY HOSPITAL FAMILY PRACTICE SETTING

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Purpose: Medication therapy management services have been well documented in the literature to optimize therapeutic outcomes for individual patients; however, the extent of these services within the community hospital family practice setting continues to evolve. The opportunity for implementation of a Medication Therapy Management (MTM) Clinic was identified as an advantageous strategy for reducing adverse drug events, improving patient compliance, and optimizing drug therapy regimens. The intent of the service was to develop a multidisciplinary team approach for collaborative practice with a focus on continuity of patient-care by providing educational services along with individual pharmacotherapy management.

Methods: Implementation of the MTM Clinic commenced with the development of policies and procedures approved by the Hospital Pharmacy and Therapeutics Committee. The document outlined procedures and established guidelines for the adjustment of a drug regimen by a pharmacist through a physician-directed protocol. Pharmacists would provide consultative services in a family practice clinic that included education of health care professionals, review of patient medication histories, recommendation of drug therapy changes, direct patient counseling, and pharmacotherapy disease management. Protocols were developed in accordance with current treatment guidelines for diabetes mellitus, heart failure, hyperlipidemia, and hypertension. Since the clinic facility utilized an electronic medical record, all referrals and pharmacist encounters were documented electronically through a template format within patient charts. Pharmacist medication therapy management services were reimbursed through the hospital outpatient prospective payment system.

Results/Conclusion: A pharmacist was available two afternoons per week to the family practice clinic staff for drug information and patients were scheduled for individual appointments. The pharmacist encounters were arranged between physician visits to facilitate safe optimization of drug therapy and efficient achievement of therapeutic goals. The establishment of medication therapy management services enhanced the pharmacist's role in chronic disease state management and instituted collaboration with other health care providers.

Learning Objectives:

Describe the pharmacist's role in medication therapy management services within a community hospital family practice clinic.

Discuss the implementation of a medication therapy management clinic through development of physician-directed protocols and determine an appropriate reimbursement strategy.

Self Assessment Questions:

True or False: The pharmacist's role in a family practice clinic includes education of health care professionals, review of patient medication histories, recommendation of drug therapy changes, direct patient counseling, and pharmacotherapy disease management.

True or False: A pharmacist may receive reimbursement for adjustment of a drug regimen for an individual patient through a physician-directed protocol.

COMPARISON OF CLINICAL AND ECONOMIC OUTCOMES IN PATIENTS UNDERGOING PERCUTANEOUS CORONARY INTERVENTION (PCI) WITH BIVALIRUDIN WITH OR WITHOUT GLYCOPROTEIN IIB/IIIA (GP IIB/IIIA) INHIBITORS VERSUS HEPARIN WITH OR WITHOUT GP IIB/IIIA INHIBITORS

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Objective: The results of the REPLCE-2 trial and its economic analysis showed that the use of bivalirudin with provisional GP IIb/IIIa inhibitor in percutaneous coronary intervention (PCI) use was as effective in preventing ischemic events as compared to heparin with a GP IIb/IIIa inhibitor, had a lower incidence of bleeding episodes and was also more cost-effective. While GP IIb/IIIa inhibitors have been shown to decrease the incidence of ischemic events in patients undergoing PCI, they are not universally used in this setting because of their cost and their high incidence of bleeding complications as compared to heparin monotherapy. The objective of this study is to characterize the use of bivalirudin in patients having PCI performed at the University of Illinois Medical Center at Chicago (UIMCC). Additionally, this study will compare bleeding complications and hospitalization costs in patients receiving bivalirudin with or without GP IIb/IIIa inhibitors for PCI to those treated with heparin with or without GP IIb/IIIa inhibitors.

Methodology: Prior to commencement, this study will be submitted to the Institutional Review Board for approval. This will be a retrospective chart review. Patients undergoing PCI from January 1, 2006 to June 30, 2006 will be eligible for inclusion. Patients for the experimental group will be identified from pharmacy dispensing records as having received bivalirudin. Patients for the control group will be identified by cath lab record and screening medical records matched according to procedure indication and type. The following data will be collected: patient age, gender, race, past medical history, procedure indication, procedure type, target vessel, thienopyridine and GP IIb/IIIa use, heparin and/or enoxaparin use, procedural resource utilization and cost. Endpoints of the study will look at incidence of major and minor bleeding during hospitalization, hospitalization costs, and post-procedural major adverse cardiac events.

Learning Objectives:

Assess the safety of bivalirudin with or without glycoprotein IIb/IIIa (GP IIb/IIIa) inhibitors heparin with or without GP IIb/IIIa inhibitors in percutaneous coronary intervention (PCI).

Assess the cost-effectiveness bivalirudin with or without glycoprotein IIb/IIIa (GP IIb/IIIa) inhibitors heparin with or without GP IIb/IIIa inhibitors in percutaneous coronary intervention (PCI).

Self Assessment Questions:

Which treatment option was safer?

When treatment option was cost-effective?

EVALUATION OF CLINICAL PHARMACY SERVICES IN THE EMERGENCY DEPARTMENT

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Purpose: To evaluate the current role of clinical pharmacists within the University of Wisconsin Hospital and Clinics emergency department (UWHC ED), document ED practitioners perceived value of the current pharmacy practice within the ED, look for areas in which current pharmacy practice can be improved, and develop a set of practice standards to help define the role of the clinical pharmacist within the ED.

Methods: This study is being conducted at a regional tertiary care teaching hospital that is a level one trauma center. The study consists of three parts. First, a two week pharmacist intervention audit will be conducted to help define current pharmacy practice within the ED. A survey will then be distributed to other practitioners within the ED to judge the value of current pharmacy services offered and to look for areas of improvement. Based on the results of part one and two, a set of practice standards will be proposed and reviewed by ED pharmacists, pharmacy managers, and ED staff to come to a consensus document.

Results: Completion of the pharmacist intervention audit showed that over a two week period pharmacists recorded a total of 478 interventions. Of those, 387 occurred within the ED. Thirty-two percent of the interventions were completing patient medication histories, 28% answering drug information questions, 25% related to medication acquisition, 9% recommendation of drug therapy or order clarifications, and 6% a combination of other interventions.

Conclusions: Results to date indicate that pharmacist within the UWHC ED are actively intervening in patient care and other activities that would be expected to translate into cost savings and enhanced medication safety. The majority of activities by pharmacists within the ED are weighted upon a few core responsibilities such as medication histories, answering drug information questions, assisting in acquisition of medications, and recommending drug therapy.

Learning Objectives:

Identify areas of involvement for clinical pharmacists within the emergency department based on current literature.

Identify areas for enhancement of established clinical pharmacy services within an emergency department.

Self Assessment Questions:

Name three specific areas for pharmacist intervention within the emergency department.

What sevicess do emergency department physicians and RNs value most from clinical pharmacists?

PRELIMINARY SAFETY AND EFFICACY EVALUATION OF A NEW ADENOSINE RECEPTOR ANTAGONIST

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Purpose:
Dipyridamole or adenosine is commonly used to dilate the coronary vasculature followed by the administration of a radiopharmaceutical for myocardial perfusion imaging. Both agents cause desirable coronary vasodilatory response by activating adenosine A2a receptors. BMS068645 is an A2a receptor agonist with greater than 100x selectivity over other subtypes. This drug has the potential to produce the required vasodilatation with fewer incidences of adverse events. A multicenter, Phase II, open-label, randomized, dose selection, crossover study of BMS068645 was conducted to evaluate the imaging efficacy and safety profile of this agent.

Methodology:
This project was approved by the Institutional Review Board. Fifteen patients who met inclusion criteria were randomized into four stratified groups which differed by drug and day of dosing. All patients received adenosine (140mcg/kg/min) on day 1 or 2. Half of the patients received BMS068645 1mcg/kg while the other half received a dosage of 2mcg/kg on the alternate day. Stress pharmacologic agent was followed by the injection of technetium Tc-99m sestamibi for perfusion imaging. Safety measures included overall incidence of new onset and treatment related adverse events in addition to examining changes from baseline of vital signs, physical conditions, ECG's and lab values. Efficacy parameters were evaluated with perfusion scores generated by the nuclear medicine physician evaluating the images who was blinded.

Results:
Fifteen new onset adverse experiences were reported with adenosine while only 3 were seen with BMS068645 in the 14 patients who completed the study. BMS068645 showed more extensive defects in 2 subjects at the vertical long axis while 3 patients had increased defects at the mid-short axis when compared to adenosine images.

Conclusions:
Preliminary data of this Phase II trial revealed promising data regarding decreases in adverse events and a Phase III clinical trial is being planned to further evaluate the safety and efficacy of BMS068645.

Learning Objectives:

Define mechanism of action of how the interventional agents discussed cause desirable vasodilatory response for the use of myocardial perfusion imaging.

Explain why the use of BMS068645 may produce less adverse events than the traditional agents.

Self Assessment Questions:

The A2b is the receptor subtype associated with less adverse events? T or F

BMS068645 has greater than 100x selectivity for the A2a receptor than adenosine and dipyridamole. T or F

A RETROSPECTIVE REVIEW OF CYCLOBENZAPRINE IN ELDERLY ADULT PATIENTS

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Background: Cyclobenzaprine is a commonly prescribed muscle relaxant for the treatment of acute muscle spasm and pain. Adverse effects of cyclobenzaprine reported in adult patients at therapeutic doses include hallucinations, mania, psychosis, and seizures. This led the investigators to evaluate its adverse effects in the elderly population.

Objective: This 12-month retrospective study will evaluate the adverse effects of cyclobenzaprine in elderly patients (>70 years old). Secondary objectives will evaluate and assess if the adverse effects of cyclobenzaprine are influenced by dose, drug interactions, and impaired hepatic function. The authors have hypothesized that elderly patients 70 years of age and older will experience on average more than 3 occurrences of adverse effects due to the cyclobenzaprine utilized.

Methodology: A retrospective chart review will be conducted at a Midwest teaching hospital. Patients included will be elderly patients admitted to an adult medical unit over a 12-month period. Subjects will include elderly male and female patients greater than 70 years old prescribed cyclobenzaprine. The principal investigators will perform all data collection. Patient charts and necessary pharmacy records will be utilized in this study. To control for variability with regard to data collection, a standardized data collection form will be used.

Results/Conclusions: The results and conclusions to this study are pending and will be presented at the conference.

Learning Objectives:

Recognize the potential adverse drug reaction profile of cyclobenzaprine in elderly adult patients.

Explain the potential influence of cyclobenzaprine dose, drug interactions, and hepatic impairment on adverse effects

Self Assessment Questions:

Which of the following is a potential side effect of cyclobenzaprine?
a.Constipation
b.Drowsiness
c.Hallucinations
d.All of the above

Which of the following is NOT true regarding the dosing of cyclobenzaprine?
a.The recommend dose of cyclobenzaprine is 10mg po TID
b.The recommend dose of cyclobenzaprine in renal impairment is 5mg po TID
c.The recommend dose of cyclobenzaprine is hepatic impairment 5mg po TID
d.All of the above

EVALUATION OF PHARMACOLOGIC DETOXIFICATION IN PATIENTS ENROLLED IN AN OUTPATIENT ALCOHOL DETOXIFICATION OR OUTPATIENT PAIN PROGRAM

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Background: Clarian Health currently offers two outpatient programs that serve to help rehabilitate patients with chemical dependency. These programs focus on rehabilitating patients with alcohol dependency and/or patients with other chemical dependencies as a result of chronic pain. The goal of these programs is to graduate patients free of alcohol and/or narcotics or other mood-altering medications. Depending on rating scale assessment scores and clinical judgment, patients can receive pharmacologic detoxification with either diazepam (alcohol program) or morphine sulfate (pain program). The goal of this project is to compare the rate of success of patients that receive pharmacologic detoxification to those who do not.

Methods: This retrospective chart review will evaluate patients enrolled in both the Outpatient Chronic Pain Rehabilitation Program and the Chemical Dependency Program from May 1, 2004 to May 31, 2006. Data will be collected from each program, containing 2 different subpopulations; patients who in addition to standard behavioral therapy either received pharmacologic detoxification or did not receive pharmacologic detoxification. The primary objective of this study is to evaluate of the successful graduation between the two groups. Secondary endpoints include evaluation of total length of admission in the program, rate of readmission for substance abuse, and number of missed sessions of patients receiving pharmacologic detoxification versus patients that do not receive treatment.

Results/Conclusion: Data is currently in the process of being collected and analyzed. Results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Explain the role of pharmacologic detoxification in the outpatient setting for both alcohol and opiate detoxification.

Recall appropriate agents used for both alcohol and opiate detoxification.

Self Assessment Questions:

1.Which of the following is the least preferred agent for outpatient alcohol detoxification?
a.diazepam (Valium)
b.chlordiazepoxide (Librium)
c.alprazolam (Xanax)
d.oxazepam (Serax)

2.Which of the following agents is can be used after opiate withdrawal (weans) as a non-opiate/non-mood altering agent to control pain?
a.fentanyl
b.ibuprofen
c.propoxyphene/acetaminophen
d.hydromorphone

IMPACT OF A MEDICATION INFORMATION WEBSITE FOR PATIENTS WITH A PLANNED ADMISSION TO THE UNIVERSITY OF MICHIGAN HOSPITAL

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Background:
A recent report by the Institute of Medicine titled "Preventing Medication Errors: Quality Chasm Series" outlines several recommendations to improve patient safety during hospitalization. The first recommendation states "To improve the quality and safety of the medication-use process, specific measures should be instituted to strengthen patients' capacities for sound medication self-management." To accomplish this, a website was developed for patient's to view prior to their admission to the hospital. With the aid of the Public Relations and Marketing department, the website is designed to assist patients in gathering medical information prior to admission. It also lists suggestions in which they can partner with the medical team to maximize safety as well as questions to ask upon receiving a new medication.

Methods:
This is a prospective, randomized, controlled trial. All patients with future admission dates will be randomized to the control or intervention arms based on their medical record number. Patients with a medical record number ending in an odd number will be part of the intervention group and those ending with an even number will be part of the control group. Patients in the intervention arm will be directed to the website 7-14 days prior to their hospital admission. Both groups will then be passively followed through their hospitalization. Upon discharge, both groups will be asked to complete a survey in which they will be asked questions about behaviors throughout their hospital stay. A chi-square analysis will be performed on the survey results between both groups.

Results:
Data collection will be in progress. IRB approval is currently pending. Results comparing survey responses between the intervention group and the control group will be presented.

Learning Objectives:

Identify two recommendations put forth by the Institute of Medicine's recent report on improving patient medication safety.

Describe how a medication information website may influence patient behavior.

Self Assessment Questions:

True / False - Patient education regarding safe and effective use of medications is not essential to medication safety.

True / False - Directing patients to a medication information website may influence patient behavior.

PERIOPERATIVE PLASMAPHERESIS FOR THE PREVENTION OF FOCAL SEGMENTAL GLOMERULOSCLEROSIS POST-RENAL TRANSPLANT

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Purpose: The rate of recurrence of focal segmental glomerulosclerosis (FSGS) is approximately 30% in patients receiving primary renal transplants, and it approaches 80% in patients who have previously lost an allograft to the disease. Plasmapheresis (PP) is often used as a treatment modality for recurrent FSGS, but few studies have evaluated its use for the prevention of the disease. We looked at our experience in 25 patients with FSGS who underwent renal transplantation (RT) in order to examine the effect of perioperative PP on disease recurrence as well as patient and graft survival.

Methods: This study was conducted as a retrospective review of the medical records of patients presenting for RT from January 1, 1997 through March 31, 2006 with a diagnosis of FSGS. Data collection included an assessment of the patients' pre-, peri-, and post-transplant courses. The primary objective of the study was to examine the rate of recurrence of FSGS in patients who received perioperative PP versus those who did not. Secondary objectives included a comparison of renal function, proteinuria, and patient and graft survival in both groups.

Preliminary Results: Of 25 patients who met the inclusion criteria, 52% underwent perioperative PP (n=13). 38% (n=5) of patients who underwent perioperative PP experienced recurrence of GSGS whereas only 25% of patients who did not receive perioperative PP experienced disease recurrence. In their first year post-RT, 15% of patients in the perioperative PP group had graft loss as opposed to 42% in the non-PP group. The differences between renal function as measured by changes in serum creatinine and proteinuria at 1, 3, 6, and 12 months were not significant between the two groups.

Conclusion: At this time, based upon preliminary data, the use of perioperative PP in RT patients with FSGS does not reduce disease recurrence. Final data analysis pending.

Learning Objectives:

Understand the rationale behind plasmapheresis as a prophylactic and treatment modality for FSGS in patients undergoing renal transplantation.

Discuss the considerations that must be accounted for when incorporating prophylactic plasmapheresis into renal transplant protocols based upon knowledge of study background and results.

Self Assessment Questions:

Plasmapheresis is utilized in renal transplant patients with FSGS in order to:
a. Decrease the need for immunosuppression
b. Eliminate sclerosed glomeruli
c. Eliminate the contributing circulating factor
d. Filter blood of excess albumin

Which of the following is not a consideration when implementing plasmapheresis into renal transplant protocols prevention of FSGS recurrence:
a. Efficacy of therapy
b. Procedure and resource costs
c. History of previous graft loss to FSGS
d. History of hemodialysis use

UPPER EXTREMITY DEEP VENOUS THROMBOSIS (UEDVT): A RETROSPECTIVE EVALUATION

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PURPOSE: Extensive literature exists regarding lower extremity deep venous thrombosis risk factors, prevention, and treatment; however, this is not the case with UEDVT due to a lack of large randomized controlled trials. The objective of this study is to retrospectively evaluate UEDVT associated risk factors, deep venous thrombosis (DVT) prophylaxis strategies utilized in patients diagnosed as an inpatient or with recent hospitalization, and describe treatment outcomes for patients with UEDVT managed at an anticoagulation clinic.
METHODS: A retrospective chart review of patients with UEDVT, defined as a clot in the axillary, brachial, subclavian, or internal jugular vein, and diagnosed January 1, 1996-June 30, 2006 was performed for patients who received anticoagulation management at the University of Illinois at Chicago Medical Center Antithrombosis Clinic. Patients were identified by a review of existing antithrombosis clinic records and children less than 18 years old were excluded. A data collection form is being used to collect pertinent data including demographics, risk factors for venous thromboembolism (VTE), anatomic location of UEDVT, symptoms, methods of diagnosis, DVT prophylaxis (where applicable), and treatment outcomes.
RESULTS/CONCLUSIONS: At the present time, 73 subjects have been identified and data has been collected on 15 subjects. Of these 15 subjects, 14 had indwelling central venous catheters at the time of diagnosis. Final results and conclusions will be presented at the conference.

Learning Objectives:

Describe common symptoms, prevention strategies, and treatment outcomes identified for patients with UEDVT.

List the most prevalent risk factors associated with UEDVT and compare them to risk factors associated with lower extremity DVT.

Self Assessment Questions:

Knowledge regarding risk factors, prophylaxis, and treatment of UEDVT is largely based on data from lower extremity DVT. T/F

What is the most common risk factor associated with UEDVT?

EVALUATION OF VANCOMYCIN LEVELS ON RENAL FUNCTION AMONG A VETERANS AFFAIRS GERIATRIC POPULATION

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Purpose:
Vancomycin therapy is known to cause nephrotoxicity at a reported incidence rate of 5 to 35%. Risk factors for vancomycin associated nephrotoxicity include concomitant use of nephrotoxic medications, advanced age, pre-existing renal dysfunction, and vancomycin exposure. During the last decade, vancomycin dosing has become more aggressive resulting in higher serum vancomycin concentrations. The impact of higher concentrations on renal function is unclear.

The objective of this study is to evaluate the incidence of nephrotoxicity in patients maintained on vancomycin at trough levels of 15 mg/L or greater compared to those with trough levels less than 15 mg/L. Nephrotoxicity will be defined by an increase in serum creatinine of 0.5 mg/dL or a 50 percent increase above the baseline level.

Methods:
This study is a retrospective review of Lexington VA patients that received vancomycin with therapeutic drug monitoring. Patients included in the study must have had stable baseline renal function and at least one steady state vancomycin trough level. Patients were excluded from the study if they received vancomycin 4 days or less, were less than 65 years of age at the time of vancomycin administration, or those with pre-existing renal dysfunction defined as a creatinine clearance less than 30 ml/min. Group assignment is based on the maintenance of a steady state vancomycin trough level of 15 mg/L or greater or a trough level less than 15 mg/L. Demographic and clinical information collected on each patient included: age, sex, height, weight, baseline serum creatinine, length of vancomycin therapy, total cumulative dose of vancomycin received, steady state vancomycin trough levels, serum creatinine during vancomycin therapy, serum creatinine at least 1 week after discontinuation of vancomycin therapy and concomitant nephrotoxic medications administered during vancomycin therapy.

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

Learning Objectives:

To appreciate the incidence of nephrotoxicity with vancomycin use

To understand variables that contribute to nephrotoxicity with vancomycin use

Self Assessment Questions:

When aggressively-dosing vancomycin what is the therapeutic goal for a trough?
A.5-10 mcg/ml
B.10-15 mcg/ml
C.15-20 mcg/ml
D.20-25 mcg/ml

T/F Other nephrotoxic medications do not contribute to vancomycin nephrotoxicity.

EFFECTS ON THE SCREENING AND MONITORING OF METABOLIC COMPLICATIONS FROM LOW DOSE QUETIAPINE AFTER IMPLEMENTATION OF AN ORDERING TEMPLATE.

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Purpose: Atypical antipsychotics, while improving the treatment of many psychiatric diseases, are linked to elevated cholesterol, diabetes, and weight gain. The American Diabetes Association, American Psychiatric Association, American Association of Clinical Endocrinologists, and North American Association for the Study of Obesity convened in 2003 to develop consensus guidelines for monitoring of metabolic adverse effects. Quetiapine is used in a variety of disease states and may be assumed to be more benign than at low doses. The purpose of this study is to determine if a new ordering template increases the number of patients on low dose quetiapine who receive appropriate baseline and 12 week follow-up monitoring for metabolic side effects.

Methodology: This study was approved by the Institutional Review Board. Low dose quetiapine was defined as =200mg. Appropriate monitoring was defined as meeting 3 out of 4 recommended parameters including blood pressure, body mass index (BMI), fasting plasma glucose, and fasting lipid profile. The ordering template was implemented in December 2005 for all atypical antipsychotics. This template reminds providers of the monitoring criteria, shows lab work, and allows ordering of appropriate labs directly from the template. The computerized medical record identified patients who began low dose quetiapine after implementation of the ordering template. The following data was collected: age; gender; ethnicity; psychiatric diagnoses; BMI; fasting glucose and or hemoglobin A1c; fasting lipid profile; blood pressure; hyperlipidemic medications; smoking history; and antihypertensive medications. All patient data was recorded without patient identifiers and maintained confidentially. Groups will be compared using a chi-squared test.

Summary of preliminary results: A previous study addressed the percentage of patients appropriately monitored prior to template initiation. It found that 21% of patients were appropriately monitored and 29% had no monitoring.

Learning Objectives:

Identify appropriate monitoring parameters of metabolic complications from atypical antipsychotics

Explain the utility of an ordering template for screening and monitoring of metabolic complications caused by low dose quetiapine.

Self Assessment Questions:

List four parameters recommended by consensus guidelines for the screening and monitoring of metabolic compliations from atypical antipscyhotics.

True or false: Low dose quetiapine has been shown to cause less metabolic side effects than when used at higher doses.

RETROSPECTIVE EVALUATION OF DELIRIUM IN MEDICAL AND SURGICAL CRITICALLY ILL PATIENTS AT DETROIT RECEIVING HOSPITAL.

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Background: Delirium in the intensive care unit (ICU) or ICU psychosis has been described in the literature since the late 1970's, and relatively few studies address diagnosis, treatment, and outcomes associated with ICU delirium. Occurance of ICU delirum ranges from 6-80% with mortality having a significant impact on patient outcomes. Age, mechanical ventilation, physical restraint use, and sedatives have been associated with increasing the occurance of ICU delirium. Currently, Detroit Receiving Hospital (DRH) does not have a standardized assessment tool for monitoring, diagnosing, or recognizing patients with ICU delirium.

Purpose: To determine the occurrence of delirium in the medical and surgical ICU at DRH.

Methods: This is a retrospective study of patients = 18 years old who are admitted to the medical or surgical ICU for = 72 hours from March 1 to July 31, 2006. The exclusions criteria consists of patients with stroke, brain injury, dementia, Alzheimer disease, visual or hearing impairment, seizure disorder, schizophrenia, alcohol withdrawal, suicide attempt, drug overdose, and current therapy with neuromuscular blocking agents. Baseline data include age, gender, diagnosis, and APACHE II. Additional data obtained are the type and amount of sedatives and opioids prescribed, Modified Ramsey Sedation Score (MRSS), patient disposition, ICU and hospital length of stay, and the incidence of intubation and extubation. Patient data will be compared to the current published data. This evaluation will be instrumental toward the implementation of an assessment tool and educating ICU healthcare providers regarding ICU delirium.

Results: Data collection is in progress. Results and conclusions will be presented at the conference.

Learning Objectives:

To define ICU delirium, recognize the three subtypes of delirium and understand the etiology of delirium.

To discuss current pharmacological and non-pharmacological options for the treatment of ICU delirium

Self Assessment Questions:

ICU delirium increases mortality, hospital cost, and impairs cognitive function. T or F

The three subtypes of delirium are hypoactive, hyperactive and confused delirium. T or F

MEDICATION EVALUATION IN ELDERLY HOSPITALIZED PATIENTS AT RISK FOR DELIRIUM

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Purpose:
Due to altered pharmacokinetics and pharmacodynamics associated with the aging process, medications are the most common risk factor for development of delirium in the elderly. Our institution has a hospital elder life program to reduce the incidence of delirium in hospitalized elderly patients. Currently, pharmacists are not directly involved. The objective of this study is to compare the incidence of delirium before and after a pharmacist focused intervention in patients enrolled in this program.

Methods:
A retrospective review has been conducted to determine baseline rates of delirium of 50 randomly selected patients enrolled in the hospital elder life program between January 1, 2006 and August 1, 2006. A prospective review that began in November, 2006, is being conducted in 50 randomly selected patients enrolled in the program. A pharmacist focused intervention through a medication evaluation and a pharmacist to physician communication form with recommendations is being conducted in these patients. An analysis will then be conducted in these patients to determine the incidence of delirium following the intervention. The indicators for delirium include the use of Haldol or Ativan as rescue medication, the use of sitters, and the use of restraints. The following data is also being collected in all patients: patient age, past medical history, home medications, inpatient medications, creatinine clearance, number of falls, and length of stay. The retrospective data will be compared to the prospective data to determine if a pharmacist focused intervention impacts the incidence of delirium for patients enrolled in the hospital elder life program.

Results are pending the completion of data collection.

Learning Objectives:

To discuss the medications most commonly associated with delirium in the elderly.

To assess the potential impact of pharmacist involvement in a program to reduce delirium in elderly hospitalized patients.

Self Assessment Questions:

True or False: Sedative hypnotics, analgesics, and medications with anticholinergic properties are most commonly associated with delirium.

True or False: Medications with long half-lives and altered pharmacokinetics in renal failure should be avoided in the elderly.

INCIDENCE AND TREATMENT OF NEW ONSET ATRIAL FIBRILLATION IN SUBARACHNOID HEMORRHAGE PATIENTS

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Purpose: While the incidence and risk factors of postoperative atrial fibrillation in cardiac surgery patients have been published in the literature, this information in neurosurgery patients is largely absent. The primary objective of this study is to describe the incidence of postoperative atrial fibrillation in subarachnoid hemorrhage (SAH) patients. Secondary objectives include to identify common characteristics of patients who develop postoperative atrial fibrillation and to identify the treatment and duration of therapy used to manage postoperative atrial fibrillation in SAH patients.

Methodology: The study protocol has been approved by the IRB and a waiver of informed consent obtained. A single center, retrospective, controlled descriptive study will be performed. Patients admitted from 2002 through 2005 with SAH will be identified in the ICU log books and screened for new-onset postoperative atrial fibrillation diagnosed by electrocardiogram or physician documentation. Subjects who developed atrial fibrillation will form the study group; those who did not constitute control subjects. Control and study subjects will be matched (1 to 1) by age, gender, SAH grade and location, and SAH treatment. Patients with prior atrial fibrillation or flutter and those under 18 years of age are excluded from the study.

Data collection will include patient-specific demographics and information regarding the surgical procedure and postoperative course. Data regarding the presence or absence of specific co-morbid disease states will be collected. The grade, location, and treatment of SAH will be recorded to match control and study subjects. Treatment-specific data to be collected include: preoperative and postoperative use of antiarrhythmics, duration of therapy, postoperative electrolyte replacement, and antiarrhythmics upon discharge. Descriptive statistics will analyze the study population baseline and treatment characteristics, while regression analysis will analyze for differences between the study and control groups.

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

Learning Objectives:

To identify proposed mechanisms and etiologies for the development of postoperative atrial fibrillation in subarachnoid hemorrhage (SAH) patients.

To describe demographic characteristics of SAH patients implicated in the development of postoperative atrial fibrillation.

Self Assessment Questions:

The development of atrial fibrillation postoperatively has not been associated with any other complications or increased length of stay. True or False

Factors putting patients at risk for the development of postoperative atrial fibrillation may include specific co-morbidities, electrolyte imbalances, and fluid balance, although a definitive etiology has not been elucidated. True or False

ASSESSING THE IMPACT OF LIFESTYLE MODIFICATION EDUCATION ON KNOWLEDGE AND BEHAVIOR CHANGES IN GERD PATIENTS ON PPI'S

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PURPOSE: The majority of patients with Gastro-Esophageal Reflux Disease(GERD) achieve adequate symptom control through a combination of non-pharmacological and pharmacological therapy. Non-pharmacological treatment includes lifestyle modifications, which are a key component in GERD management and should be incorporated into all treatment stages. The purpose of this study is to assess patients' knowledge of GERD lifestyle modifications, and identify patients' behaviors associated with GERD management pre and post educational intervention.
METHODS: A pre-test and survey will be designed to assess patients on their knowledge regarding lifestyle modifications and current behaviors that may trigger or worsen GERD respectively. The study will be conducted at five health centers located in Columbus, OH that serve primarily indigent patients. Subjects 18 years and older with a GERD diagnosis currently treated with a PPI will be asked to participate. A minimum of 100 pre-tests and surveys will be completed. Investigators and trained supervised pharmacy students will verbally administer and record the pre-test and survey answers during an appointment. Bilingual interpreters will be used with non-English speakers. Patients will be randomly assigned to the intervention group or control group. After the pre-test and survey are completed, those in the intervention group will be educated for 10-15 minutes on basic GERD lifestyle modifications that should be incorporated with PPI treatment. A national association's patient handout with self-care changes will supplement verbal education. A post-test and survey with the same questions will be given 8 to 12 weeks after the initial session to assess all patients on knowledge and behavior changes. The post-test and survey will be administered to the patient during a scheduled follow-up appointment or via phone, as per patient preference determined during the initial visit. Patients will be given an incentive to participate. Research is in progress at this time, therefore results are not applicable.

Learning Objectives:

Describe non-pharmacological treatment options for GERD patients that should be incorporated into daily routines.

Identify patients' behaviors associated with GERD management that may worsen or trigger heartburn.

Self Assessment Questions:

What are some of the lifestyle modifications that should be started initially and continued throughout treatment for GERD patients?

What are three exacerbating foods or beverages that GERD patients should avoid?

ESTABLISHING THE ROLE OF AN EMERGENCY ROOM PHARMACIST ON CLINICAL AND FINANCIAL OUTCOMES, WITH AN EMPHASIS ON ANTIMICROBIAL STEWARDSHIP

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PURPOSE: The emergency room is a fast paced environment where hundreds of people are seen daily. Unfortunately, this leads to emergency rooms being one of the environments most prone to medication errors. In order to provide comprehensive clinical pharmacy services within a health system it is important to have pharmacy presence in the emergency department. Antimicrobial stewardship is the act of optimizing infection control while practicing appropriate antibiotic utilization in an effort to decrease antimicrobial resistance. With the initiation of many antibiotics occurring in the emergency department, and the majority of patients transferring to the care of a different physician, it is especially important to practice antibiotic stewardship in this area. The purpose of this study is to determine the role of an emergency room pharmacist on both clinical and financial outcomes, with an emphasis on antimicrobial stewardship.

METHODS: Clinical pharmacy services will be provided in the emergency department over a four week period, alternating day and evening hours weekly. These services include, but are not limited to, providing drug information, dosing adjustments based on renal and hepatic function, antibiotic stewardship measures including education and appropriate initial antibiotic selection, cardiac arrest and trauma team response, education on proper medication reconciliation and admission order review including formulary interchange and patient allergy review. All interventions made by the pharmacist and accepted by the medical staff will be recorded. Data will be analyzed to determine potential financial impact as well as number of potential medication errors avoided.

RESULTS/CONCLUSIONS: Results and conclusions will be presented at the conference.

Learning Objectives:

Consider the role of an emergency room pharmacist on clinical and financial outcomes.

Establish the impact of a clinical pharmacy presence on antimicrobial prescribing habits.

Self Assessment Questions:

List 5 areas of potential intervention for pharmacists working in the emergency department.

List 2 types of interventions that pharmacists can suggest as antimicrobial stewards.

DEVELOPMENT OF A MEDICATION THERAPY MANAGEMENT SERVICE IN A GROCERY CHAIN PHARMACY

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Purpose: The Medicare Modernization Act of 2003 provided pharmacists with the opportunity to become a key to provide Medication Therapy Management (MTM) Services for Medicare recipients. It marks the first time pharmacists are eligible to receive reimbursement from Medicare for their patient care services. The MTM Services Working Group has developed a definition of MTM services. APhA and NACDS collaborated to develop framework to guide pharmacists in providing services. However, the actual development of services has been left to the discretion of prescription drug plans and pharmacists. Therefore, the purpose of this project was to develop and implement a medication therapy management program in a grocery chain pharmacy for patients with diabetes, hypertension, and/or hyperlipidemia. This project evaluated the number and type of interventions provided by the pharmacist, the economic impact of the program, and the cost for the pharmacy to provide the MTM program.

Methods: In order to develop a Medication Therapy Management Program the study pharmacist established policies and procedures to guide the service in the grocery chain pharmacy. Eligible patients included those who met the criteria outlined by the Medicare Modernization Act of 2003 and had one or more of the following chronic disease states: hypertension, diabetes, or hyperlipidemia. The pharmacist, at the initial visit, completed a comprehensive patient history and a medication review with the patient or caregiver. After any problems were identified, the pharmacist contacted the physician and provided recommendations to improve the patient's medication regimen. After receiving physician feedback, the pharmacist created a medication action plan and a personal medication record for the patient. Subsequent visits or follow-up phone calls were utilized to make sure the patient understood any changes to their medication record. All pharmacist recommendations and interventions were documented and assigned a cost for data analysis.

Results/Conclusions: Data collection is in progress.

Learning Objectives:

Describe the type of interventions provided by pharmacists in a grocery chain pharmacy Medication Therapy Management Program.

Describe the economic impact a medication therapy management program has on Medicare Part D Prescription Plans and the grocery chain pharmacy providing the service.

Self Assessment Questions:

The Medicare Modernization Act of 2003 represents the first time pharmacists are eligible to receive reimbursement from Medicare for patient care services?
A.True
B.False

Medicare provides the framework to help guide pharmacists in providing MTM services, as well as, policies and procedures for the development of such services.
A.True
B.False

EVALUATION OF GLYCEMIC CONTROL IN PATIENTS TRANSITIONING FROM INSULIN DRIP IN A COMMUNITY HOSPITAL

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Purpose:
Intensive insulin therapy in critically ill patients has been shown to decrease morbidity and mortality. Patients with tight glycemic control in the intensive care unit (ICU) requiring mechanical ventilation have demonstrated a 34% reduction in mortality and a significant reduction in the incidence of sepsis, the need for blood transfusions, and renal replacement therapy. A critical care insulin drip protocol was developed in February 2006 at St. Margaret Mercy Healthcare Centers, an 800 bed community hospital. In order to maintain tight glycemic control after the insulin drip was discontinued a corresponding protocol was necessary. A transition subcutaneous insulin protocol using basal and bolus insulin was developed and implemented in November 2006. The purpose of the study is to compare the effectiveness of glycemic control before and after the implementation of the transition insulin protocol.

Methods:
Following IRB approval, a list of ICU patients transitioned from the insulin drip was generated. One hundred charts were randomly selected from June 2006 to January 2007. A retrospective chart review was conducted for 50 patients before and 50 patients after the implementation of the transition insulin protocol. A medication utilization evaluation (MUE) form was developed to collect patient demographics, insulin therapy data, blood glucose (BG) averages, and length of ICU stay. A comparative analysis will be done to evaluate the glycemic control of both groups.
Glycemic control was defined as blood glucose between 100-150 mg/dL

Results:
Results pending

Conclusion:
Conclusion pending

Learning Objectives:

Understand how tight glycemic control is maintained using a subcutaneous basal-bolus insulin method.

Determine when it is appropriate to transition a patient off an insulin drip.

Self Assessment Questions:

Insulin aspart is considered a bolus insulin.(True/False)

Tight glycemic control can increase hospital mortality.(True/False)

DEVELOPMENT AND IMPLEMENTATION OF A MEDICATION THERAPY MANAGEMENT (MTM) SERVICE IN A COMMUNITY PHYSICIAN OFFICE SETTING

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Purpose:
MTM is now covered under the current Medicare Prescription Drug Benefit. There is evidence in the literature demonstrating that pharmacist interventions can help to improve patient outcomes. Community physician offices provide an excellent environment for the development and implementation of MTM Services (MTMS). Little data is available evaluating the impact of pharmacists' interventions in this setting. The objective of this project is to implement MTMS in a community physician office and to demonstrate that clinical pharmacists providing MTM can significantly impact clinical, economic, and humanistic outcomes.

Methods:
A pharmacist providing MTM will be placed in a community physician office. MTM may include, but is not limited to, education, medication compliance counseling, therapeutic drug monitoring, laboratory follow-up, blood pressure monitoring, demonstration/evaluation of medication administration technique, evaluation of polypharmacy, smoking cessation, disease state management, or medication dose titration. Care provided will be that suggested by nationally accepted guidelines and recommendations (i.e., standard of care). Patients may be referred for MTM by office staff or MTM will be offered to uncontrolled diabetic patients (HbA1c >/= 7) identified by proactive chart review. Clinical, economic, and humanistic outcomes will be assessed via markers of disease (i.e., HbA1c), a program designed to record pharmacist interventions and evaluate their economic impact, and patient/provider surveys.

Results:
Patient recruitment is ongoing. Sixty-two uncontrolled diabetic patients have been identified thus far; three have received services. The majority of therapeutic recommendations offered to providers in this office have been accepted and implemented. No data with regards to clinical, or economic outcomes are available at this time. Preliminary humanistic outcomes indicate both patients and providers are satisfied with the services offered and find them valuable.

Conclusions:
MTMS appear to be of value. Additional data currently being collected will hopefully add evidence validating the benefits of MTMS offered by clinical pharmacists.

Learning Objectives:

Discuss the various stages in the evolution of the profession of pharmacy.

Understand the rationale behind pharmacist provision of medication therapy management and the potential impact on clinical, economic, and humanistic outcomes.

Self Assessment Questions:

Patients eligible to receive medication therapy management, as identified by the Medicare Prescription Drug, Improvement, and Modernization Act of 2003, include patients:
a. Having multiple chronic conditions.
b. Receiving multiple medications.
c. Over the age of 85.
d. Both a. and b.

Two significant studies evaluating the impact of ambulatory care clinical pharmacists are:
a. The IMPROVE Study.
b. COMET.
c. The Asheville Project.
d. Both a. and c.

PATIENTS' NEEDS AND INTERESTS IN A SELF-PAY MTM SERVICE

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Objective:
Medication Therapy Management (MTM) services are required for certain patients with Medicare Part D prescription coverage through the passage of the Medicare Prescription Drug, Improvement and Modernization Act (MMA) of 2003. Many Part D beneficiaries are in need of MTM services, but the MMA MTM stipulation makes this service available only to "high-risk" beneficiaries. Many patients who are not eligible for Medicare or beneficiaries not considered to be at "high-risk" could also benefit from MTM services. Community pharmacists have experience in providing MTM services to Medicare Part D patients with positive results. Realizing that many payers do not reimburse pharmacists for MTM services, the primary objective of this study is to determine patients' willingness to receive and pay for MTM services when they are not eligible to receive these services as part of their health benefit.
Methods:
A self-administered survey will be given to a convenience sample of patients at 45 grocery-store chain pharmacies in the Chicago-metropolitan area. Pharmacies will be selected on the basis of the presence of pharmacy students on clerkship rotations and pharmacists that participate in the chain's other clinical programs; these students and pharmacists will distribute the surveys.
Results:
Descriptive statistics will be used to determine the needs and interests of patients in receiving MTM services. Patient needs and interests are expected to vary based on number of medications used, number of chronic conditions, location, and presence of current prescription and medical insurance coverage.
Conclusions:
The results are expected to help identify the specific needs and interests of patients not eligible to receive MTM services through Medicare Part D or other third party payers. This will be beneficial in determining the best approach to developing and implementing a self-pay MTM program.

Learning Objectives:

Describe the benefits of pharmacist-based MTM services in the community setting.

Determine which patient populations are interested in receiving MTM services.

Self Assessment Questions:

True or False: The main goal of MTM is to reduce prescription drug costs.

True or False: Most insurance companies do not currently reimburse pharmacists for MTM services.

TREATMENT OF URINARY TRACT INFECTIONS IN TRAUMATIC INJURY PATIENTS ADMITTED TO THE SURGICAL INTENSIVE CARE UNIT

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Intensive care units (ICUs) have the highest prevalence of nosocomial infections. Infection of the urinary tract is the most common hospital-acquired infection and is the most frequent nosocomial infection in critically ill patients. It is estimated that 8% to 31% of patients in an ICU acquire a urinary tract infection (UTI) during their stay. UTIs have been identified to be the source of septic syndrome in approximately 10% to 15% of cases, and have been associated with an increased risk for morbidity and mortality. In addition, UTIs result in an increase in hospital stay and cost. The predominant risk factor for developing a UTI is the presence of an indwelling bladder catheter. Additional risk factors include longer duration of catheterization, increased length of ICU stay, female gender, inadequate catheter care, and lack of antimicrobial usage. Treatment consists of removing an indwelling bladder catheter, if possible, and antimicrobial agents.

The purpose of the study is to determine if traumatic injury patients admitted to the surgical ICU, who develop a UTI, are treated appropriately. Secondary objectives include calculating recurrence rate and identifying the most common pathogens that cause a UTI.

A retrospective, descriptive chart review of all adult trauma patients with a UTI who were admitted to the surgical ICU for at least two days at MetroHealth Medical Center was undertaken. The study period is from January 1, 2004 to June 30, 2005. Data collection includes demographics, co-morbid illnesses, cultures and sensitivities, treatment, and duration of therapy. Antibiotic selection, dosing regimen, duration, and causative microorganism will be examined to determine appropriate treatment.

Data collection is in process. Results and conclusions will be presented at the conference.

Learning Objectives:

Identify risk factors for urinary tract infections (UTIs) in ICU patients.

State the appropriate duration of treatments for nosocomial UTIs.

Self Assessment Questions:

UTIs are the most frequent nosocomial infection in critically ill patients? T or F

What is the most common risk factor for a patient developing a UTI?

EVALUATION OF THE NEED FOR IMPLEMENTATION OF UNFRACTIONATED HEPARIN MONITORING BY ANTIFACTOR XA ASSAY

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Background: Monitoring of heparin is required to reach therapeutic blood levels and prevent adverse effects since individual response to heparin varies significantly. The most common method to monitor heparin therapy is the activated partial thromboplastin time (aPTT). Several disadvantages of aPTT heparin monitoring exist: a therapeutic aPTT range must be changed upon switching reagents, reagent lots, or instrumentation due to differences in heparin sensitivity; an aPTT may be affected by other factors; and an aPTT frequently does not correlate with heparin blood concentration or effects. An alternative to aPTT monitoring of heparin therapy is antifactor Xa monitoring. By monitoring actual heparin activity level, the antifactor Xa assay has been found to better correlate with heparin levels than the aPTT resulting in less monitoring, quicker therapeutic outcomes, and less adverse events. Despite these advantages, the test is relatively expensive and not widely used.

Purpose: To determine whether antifactor Xa monitoring of heparin therapy is associated with less dosage changes and better patient outcomes than traditional aPTT monitoring in a medium-sized hospital.

Methods: A retrospective drug use evaluation was conducted using an electronic database to identify patients who received heparin infusions during November to December 2006. The following information was collected: patient demographics, indication for and dosing of heparin, aPTT monitoring, adverse effects, and clinical outcomes. Cases were matched with control patients from literature who received heparin therapy monitored by antifactor Xa assay rather than by aPTT monitoring and further analysis was conducted to compare the different heparin monitoring methods.

Results: Preliminary data has shown that only 15% of patient cases reviewed reached the institution's current therapeutic aPTT range with initial heparin infusion dosing; furthermore, none of the patients reaching goal remained therapeutic with the initial infusion.

Conclusion: Conclusions will be drawn based on further data analysis.

Learning Objectives:

Identify limitations to the use of aPTT monitoring of heparin therapy.

Describe advantages to using the antifactor Xa assay for monitoring heparin therapy.

Self Assessment Questions:

True or False: A new heparin therapeutic range must be calibrated with new reagents and instrumentation when using antifactor Xa heparin monitoring.

Monitoring heparin therapy with the antifactor Xa assay results in _____ dosage adjustments than when monitoring heparin therapy with the aPTT.
a. more
b. fewer
c. equal
d. none of the above; depends on the patient

AN EVALUATION OF THE CLEVELAND CLINIC FULL-DOSE WEIGHT-BASED HEPARIN NOMOGRAM

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BACKGROUND: Weight-based heparin nomograms are commonly used to dose heparin. A recent change in the lot of the reagent used to determine the activated partial thromoboplastin time (aPTT) at Cleveland Clinic required adjustments to the weight-based nomograms currently in use.
PURPOSE: To examine the Cleveland Clinic weight-based heparin nomogram (80 U/kg bolus, 18 U/kg/h initial infusion) in order to evaluate the efficacy and safety of the nomogram. Primary objective is to determine the percent of patients that achieve an aPTT within the therapeutic range within 24 hours. Secondary objectives are to investigate average time for an aPTT to become therapeutic, defined as 2 consecutive aPTTs within the therapeutic range, time to the therapeutic maintenance dose, defined as a therapeutic aPTT maintained for 2 consecutive days and to correlate anti-Xa levels to aPTT results in a subset of patients. Additional endpoints of the study are to review the timing of aPTT levels in relation to heparin dose adjustments and to stratify performance of the nomogram based on patient weight, age and risk for thrombosis or bleed.
METHODS: Concurrent review and analysis of 100 patients treated with heparin initiated at Cleveland Clinic. Patients will be identified using the Epic pharmacy order entry system and followed for a total of 96 hours or until the aPTT is therapeutic for two consecutive days. Forty random aPTT levels will be selected for anti-Xa analysis. Safety of the nomogram will be assessed by recording the incidence of major and minor bleeding.
RESULTS/ CONCLUSION: Study results will be presented at the Great Lakes Residency Conference.

Learning Objectives:

To describe the background and clinical utility of the weight-based heparin nomogram and the purpose of this evaluation

To identify the risks associated with heparin therapy

Self Assessment Questions:

True/ False: The normal therapeutic range for anti-Xa levels is 0.7-1.3 for heparin.

True/ False: Heparin nomograms are commonly used to adjust infusions to reduce the risk of bleeding or thrombosis.

PRESCRIBING PATTERNS IN PARENTERAL NUTRITION PRESCRIPTIONS

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Background
Parenteral nutrition (PN) is used to provide essential nutrients, including amino acids, dextrose and lipids to hospitalized patients with nonfunctioning gastrointestinal tracts. Prescriptions for PN are complex and can be composed of greater than twenty different ingredients. Each ingredient of PN is often customized specifically for each patient. Customizing PN is a complex process involving multiple steps, leaving several areas for potential errors. The use of standardized PN formulations would increase patient safety by potentially decreasing errors involved in customizing PN, while delivering adequate nutrition to the patient.

Purpose
To estimate the proportion of subjects requiring PN whose nutritional needs could be met with standardized PN formulations.

Methods
A total of twelve patients requiring PN will be included in this study. Data parameters to be collected include the indication for PN, underlying disease state(s), clinical laboratory values, height, weight, medical conditions, and reason for discontinuing PN. The patient will be monitored throughout the study period for changes in PN prescription, date and reason regarding PN change, enteral nutrition received, medical conditions diagnosed since initiation of PN, and reason for patient exit from the study.

Conclusion
Data collection and evaluation are ongoing.

Learning Objectives:

Identify appropriate patients to receive standardized PN

Critically examine the pros/cons of standardized PN

Self Assessment Questions:

T/F. All patients requiring PN can be fed standard PN formulas

T/F. Patients should have labs monitored while receiving PN

DEVELOPMENT OF A DIABETES EDUCATION PROGRAM FOR PATIENT SELF-ADJUSTMENT OF INSULIN THERAPY

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Purpose
Current management strategies for people with diabetes are associated with suboptimal outcomes as indicated by a recent report revealing only 37% of people with diabetes achieve an A1C of <7%. Published standards of medical care in diabetes recognize the need for collaborative, multidisciplinary teams to best manage patients with diabetes. The American Diabetes Association also acknowledges the importance of patient self-empowerment as a crucial step to optimize diabetes control.

The primary objective of this study is to implement an education program to instruct patients with diabetes on self-adjustment of individualized insulin regimens. The results of this study will contribute to the implementation of an education program for use within the primary care clinics at the Roudebush VA Medical Center.

Methods
The chief of endocrinology developed a protocol outlining appropriate insulin adjustments for both insulin monotherapy and multiple combination insulin regimens. Physicians from one primary care clinic referred patients for insulin self-management education. Patients came to a series of appointments conducted by a clinical pharmacist who provided detailed written and verbal instructions on self-adjustment insulin protocols. Patients were called on a bi-weekly basis to assess the number of insulin adjustments needed, episodes of hypo- or hyperglycemia, and compliance with blood glucose monitoring. Study analysis will include incidence of hypo- or hyperglycemia, blood sugar fluctuations, change from baseline A1C, compliance with blood glucose monitoring and adherence to insulin adjustment protocol, appropriateness of insulin adjustments for each patient, and status of associated chronic conditions.

Preliminary Results
Patient enrollment for this study is ongoing at this time. Two patients have been enrolled and have come to initial appointments to establish baseline parameters. Study analysis will begin February 2007.

Conclusions
At this time, subjective patient feedback has been positive. No significant adverse effects have been reported. Additional conclusions are expected pending further patient enrollment.

Learning Objectives:

Understand the role of clinical pharmacists in the education of insulin-treated patients with diabetes to self adjust personal insulin regimens.

Recognize the benefit of establishment of clinical pharmacy services to provide education of insulin-treated patients with diabetes to self adjust personal insulin regimens.

Self Assessment Questions:

True or False.Following thorough education by a clinical pharmacist, patients with diabetes can effectively manage his or her own insulin regimen.

True or False. Self-empowerment of patients to adjust his or her own insulin regimen can result in decreases in A1C without increased episodes of hypo- or hyperglycemia.

ASSESSMENT OF CLOPIDOGREL UTILIZATION FOR PATIENTS WITH PERCUTANEOUS CORONARY INTERVENTION (PCI, STENTS) IN A VETERANS AFFAIRS (VAMC) POPULATION

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Purpose: Clopidogrel utilization in the Veterans Affairs Integrated Systems Network (VISN) 12 generates an annual cost of about 4.6 million dollars. Currently, 6.3 percent of patients at the Milwaukee VAMC are on clopidogrel, with an annual cost of four hundred thousand dollars. The VISN 12 goal for use of clopidogrel is 6% based on national benchmarking data. This project will aim to evaluate appropriate use and prescribing behavior for clopidogrel at the Milwaukee VAMC. In addition, interventions will be made when prescribing does not coincide with evidence based indications for clopidogrel.

Methodology: Prior to initiating the study, a proposal was submitted to the Institutional Review Board for approval. The health system's computerized patient record system will be used to identify all patients with active prescriptions for clopidogrel and for chart review. Determination of pertinent patient evaluation points was based on primary literature assessment. Patient information such as duration of clopidogrel therapy, indication, stent and type, and other concurrent anti-platelet and anticoagulant medication use was entered into a computerized database. Patients will be analyzed for appropriate indications for, and duration of clopidogrel based on the guidelines from the Seventh ACCP Conference on Antithrombotic and Thrombolytic Therapy (CHEST) guidelines, VA guidelines, and the Clopidogrel for High Atherothrombotic Risk and Ischemic Stabilization, Management, and Avoidance (CHARISMA) trial. If use that does not coincide with these guidelines is identified, a progress note will be entered into the patient's chart for review by the prescribing provider. The progress note will consist of patient evaluation and evidence based recommendations. Patients who are deemed to be prescribed clopidogrel inappropriately will be followed to assess whether the provider changed his or her practice.

Preliminary Results/Conclusions: Data collection in progress. Results and conclusions will be presented at the conference.

Learning Objectives:

Identify appropriate indications and duration for clopidogrel therapy.

Identify differences in prophylaxis management for patients with stents.

Self Assessment Questions:

All drug-eluting stents have the same recommended duration of therapy for clopidogrel. T/F

Does aspirin provide similar benefits as clopidogrel for prevention of cardiac events in patients with stents?

THE IMPACT OF CLINICAL PHARMACY INTERVENTION ON ADHERENCE TO CLOPIDOGREL NATIONAL CRITERIA FOR USE IN A VETERAN POPULATION

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PURPOSE: The primary objective of this study is to determine the impact of pharmacy intervention on prescribers' adherence to clopidogrel criteria for use.
METHODS: This study is a prospective, randomized chart review. The computerized patient record system (CPRS) at the Cincinnati VAMC will be used to identify patients that have been on clopidogrel for twelve months or longer. Study subjects will be randomly selected from this population for intervention using a random number generator. Patients will be included if they have an active clopidogrel prescription, have been on clopidogrel for twelve months or longer, and have an appointment with their primary care physician (PCP) between the dates of January 3, 2007 and February 28, 2007. Patients who meet inclusion criteria will be randomized into two groups, the usual care group and the intervention group. All PCPs will receive general education on the clopidogrel criteria for use, utilization of the clopidogrel quick order set, and a brief overview of the completed clopidogrel drug use evaluation done at the Cincinnati VAMC. Education will be accomplished through a presentation at the monthly physician staff meeting and a pharmacy newsletter. In addition, patients in the intervention group will have further notification sent to their PCP prior to their upcoming appointment in the form of a templated progress note, which will include pharmacy evaluation of clopidogrel use after complete chart review. The Cincinnati VAMC's CPRS will then be utilized to compare the renewal of clopidogrel prescriptions among the two groups. Data collected will include: reason patient was started on clopidogrel, length of clopidogrel therapy, whether clopidogrel was continued or discontinued, and demographic information (patient age and comorbidities).
RESULTS/CONCLUSIONS: Data collection in progress. Results and conclusions will be presented at the conference.

Learning Objectives:

Discuss current literature regarding clopidogrel indications and appropriate durations of therapy.

Determine the impact of pharmacy intervention on prescribers' adherence to clopidogrel criteria for use.

Self Assessment Questions:

According to the clopidogrel criteria for use, appropriate indications for clopidogrel therapy include which of the following:
A.Stable coronary artery disease
B.Acute coronary syndrome with no revascularization procedure planned
C.Post PCI/stent placement
D.A and B
E.B and C

Which of the following pairs of indications and durations of clopidogrel therapies are accurate?
A.Post stent placement with a bare metal stent - at least 1 month and up to 12 months
B.Post CABG - 12 months
C.Carotid artery stenting - 4-6 months
D.Popliteal peripheral stents - 6 months
E.Intracranial stents - 24 months

EVALUATION OF EARLY THERAPY IN SEVERE SEPSIS AND SEPTIC SHOCK:
A RETROSPECTIVE REVIEW OF CLINICAL PRACTICE

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Background:
There are an estimated 750,000 cases of sepsis each year in the US, with sepsis associated mortality ranging from 30% to 50%. In 2004, Surviving Sepsis Campaign guidelines were published as a means to improve outcomes in patients with sever sepsis and septic shock.

Purpose:
The purpose of this study is to provide a comparative report of early therapy in patients with severe sepsis and septic shock before and after implementation of a standardized sepsis order set.

Methods:
This is a retrospective cohort review of two groups (sepsis order set driven care and provider driven care) of patients treated for sepsis. Patients included in the study will be age 18 years or older, diagnosed with severe sepsis or septic shock, admitted on or after 01/01/05. Patients admitted to the pediatric critical care unit, diagnosed of shock due to causes other than sepsis, and patients with do not resuscitate or limited code orders will be excluded from the study. Thirty patients will be randomly selected for each study group.

Results:
Primary outcomes to be evaluated are the total volumes of IVF's administered and time to antibiotic administration. Secondary outcomes include number of ventilator days, ICU and total hospital length of stay.

Learning Objectives:

Define Surviving Sepsis Campaign treatment guidelines.

Describe outcomes associated standardized sepsis protocols for the early management of severe sepsis and septic shock.

Self Assessment Questions:

Severe sepsis is the #1 cause of death in non-coronary ICUs. T or F

Early goal-directed therapy, recombinant human activated protein C, corticosteroids and low tidal volume in mechanically ventilated patients are interventions associated with decreased mortality in patients with severe sepsis and septic shock. T or F

A RETROSPECTIVE EVALUATION OF A PHARMACIST-DIRECTED ANEMIA MANAGEMENT PROGRAM

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Purpose: Anemia is a common problem in cancer patients that affects between 30% and 90% of patients depending on the type of cancer and disease stage. Treatments available include transfusions and erythropoietin stimulating proteins (ESPs). In August 2003, The Ohio State University Medical Center (OSUMC) implemented a pharmacist-directed Anemia Management Program for patients of the James Cancer Hospital outpatient clinics. Goals of the program are to improve adherence to ESP medication use guidelines, improve patient outcomes, educate patients, and improve data capture. Pharmacists are responsible for adherence to guidelines which include determining dose, ordering iron studies, ordering/reviewing hemoglobin (Hgb) and hematocrit (Hct) levels with each scheduled dose, dose escalation and/or de-escalation, dispensing of the ESP, and counseling patients. The purpose of this study is to evaluate adherence to the OSUMC P&T approved anemia management guidelines and to assess clinical outcomes of patients prior to and following direct pharmacist involvement.

Methods: Data collection will commence upon Institutional Review Board approval. This study will be completed through a retrospective case-matched control of patients who received darbepoetin alfa or epoetin alfa while a patient of the James Cancer Hospital outpatient clinics. Patients will be classified in two groups; those who received ESPs pre and post-implementation of the pharmacist-directed Anemia Management Program. Data will be collected on darbepoetin alfa and epoetin alfa treatment, cancer type, treatment with platinum or non-platinum containing chemotherapy, baseline and subsequent hemoglobin and hematocrit levels, baseline and subsequent iron studies, use of iron replacement therapy, darbepoetin alfa or epoetin alfa dose, interval when subsequent doses were given, dose escalation/de-escalation, number of transfusions received 4 weeks prior to treatment initiation and during study period, age, and gender.

Results/Conclusions: Data collection is ongoing and results will be presented at the conference.

Learning Objectives:

Understand the role pharmacists can play in managing cancer patients' anemia.

Compare patient outcomes and adherence to guidelines after implementation of a pharmacist-directed anemia management program.

Self Assessment Questions:

Presence of anemia in cancer patients can lead to a reduced quality of life. T or F

Darbepoetin alfa has an extended half-life and can therefore be dosed every 2 or 3 weeks. T or F

DEVELOPMENT OF POSTGRADUATE YEAR TWO (PGY2) PRACTICE MANAGEMENT RESIDENCY

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PURPOSE: The purpose of this project is to develop a specialty residency program in practice management with the intention of becoming ASHP-accredited. In addition, the goal is to ensure that at the end of the residency year the resident gains proficiency, skill, and experience and feels confident in pursuing his/her future career within the profession of pharmacy.

METHODS: The project entails four main components, including position justification, survey of other programs, program development, and recruitment.
A position justification describing the role and responsibilities of the PGY2 resident was presented to the hospital administration and received budget approval. In addition, other PGY2 practice management programs were surveyed and compared in terms of their structure, goals/objectives, available rotations, staffing, and opportunity for concomitant graduate degree.
Following review of other programs, a curriculum was developed focusing on goal and activity identification for various learning experiences. The Froedtert Hospital department of pharmacy is positioned well for a diverse mix of rotational opportunities including medication safety, pharmacy informatics, clinical practice management, operations/technology management, drug policy, senior administration, and ambulatory care management. Currently, goals/objectives and evaluation tools are being reviewed in accordance with RLS standards for the future resident. Also, graduate degree options are being explored through local universities.
The PGY2 program for 2007-08 was filled with a current PGY1 resident. Current focus is to recruit a PGY1 resident with strong interest in hospital administration.

Learning Objectives:

To become familiar with the process of starting a new specialty residency in practice management in a teaching hospital

To describe alignment of goals with rotations/learning experiences

Self Assessment Questions:

True or False: Development of Practice Management Residency at Froedtert Hospital consisted of 2 main components: program development and recruitment.

True of False: Practice Management Residency at Froedtert Hospital is not accredited by ASHP.

IMPLEMENTATION OF A VANCOMYCIN DOSING ALGORITHM IN HEMODIALYSIS PATIENTS

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Purpose: Riverside Methodist Hospital does not have a hospital-wide vancomycin dosing algorithm for hemodialysis patients. Currently, a pharmacist-driven pharmacokinetic dosing protocol is followed in which hemodialysis patients receive intermittent vancomycin doses based on goal trough concentrations of 5-20mg/L. A recent retrospective review demonstrated variations in vancomycin dosing and drug serum concentration monitoring in this patient population. Vancomycin doses and levels were ordered by a combination of pharmacists and physicians. The inconsistencies in vancomycin prescribing lead to uncertainty as to who will initiate and follow the dosing and levels. This resulted in patients sometimes receiving additional vancomycin doses, not receiving doses when appropriate, or having unnecessary levels drawn. The purpose of this study is to establish a vancomycin dosing algorithm to be used by all health care providers within Riverside Methodist Hospital to ensure the maintenance of appropriate vancomycin levels in hemodialysis patients.

Methods: An algorithm for administration of vancomycin in hemodialysis patients will be implemented by the pharmacy team in collaboration with the nephrology team. Patients included in the analysis will be those undergoing hemodialysis and prescribed vancomycin. Data collection will include patient demographics, type of infection, dialyzer membrane type used during hemodialysis sessions, vancomycin serum concentration, and vancomycin doses administered. All data collected will be used to validate the ability of the algorithm in achieving adequate vancomycin levels or recommend alterations to the algorithm for improved efficacy at Riverside Methodist Hospital. In addition, a cost analysis will be completed to compare the cost-effectiveness of the algorithm with current vancomycin prescribing patterns.

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

Learning Objectives:

To assess the validity of a vancomycin dosing algorithm in hemodialysis patients.

To discuss the financial implications of the dosing algorithm in comparison to current vancomycin dosing practices.

Self Assessment Questions:

Vancomycin half-life is not affected in patients with end-stage renal disease. T/F

Compared to the previous vancomycin prescribing patterns, the algorithm resulted in improved cost-effectiveness in relation to laboratory costs for levels. T/F

PRESCRIPTION METHODS ASSESSMENT PROJECT

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PURPOSE: To determine if the N-of-1 method of prescribing can be effectively implemented in physicians' offices and whether this will change medication selection, improve patient compliance, and reduce medication costs.

METHODS: Randomized controlled trial being conducted at 20 practice sites nationwide comparing two methods of prescribing medications, standard care method and N-of-1 method. Patients included are those 18 years with newly diagnosed or uncontrolled osteoarthritis (OA) or gastroesophageal reflux disease (GERD). Patients randomized to the standard care group receive usual care and complete monthly questionnaires reporting side effects, disease symptoms, and medication compliance for 6 months. Patients randomized to the N-of-1 intervention group will have their original prescription replaced by a prescription for a combination of two medications to be taken in a randomized cross-over design over the course of the 72-day intervention period. The possible medications studied for OA patients include naproxen 500mg BID, celecoxib 100mg BID and meloxicam 7.5mg daily. The possible medications studied for GERD patients include ranitidine 300 mg QHS, omeprazole 20 mg QHS, omeprazole 40 mg QHS, pantoprazole 40 mg QHS, and esomeprazole 40 mg QHS. After the intervention period, the physician will receive a recommendation based on the patient's daily diary of side effects and symptoms. Those patients will then be asked to complete additional questionnaires at 3 and 6 months after the intervention period to report side effects, symptoms, and medication compliance.

PRELIMINARY RESULTS: To date, 7 patients have been enrolled at our site, and 47 patients have been enrolled nationally. None of these patients have completed the intervention period.

CONCLUSIONS: Data collection is in progress. The expected completion date is January 2008.

Learning Objectives:

Identify the steps necessary to involve physicians in identifying potentially eligible patients.

Develop methods to successfully enroll patients into a national study.

Self Assessment Questions:

Describe common difficulties encountered when implementing a national study into a family medicine residency program.

List methods to increase the number of patients enrolled into a study.

CRESTOR (ROSUVASTATIN): SAFETY AND EFFICACY IN ACHIEVING LDL GOALS IN HYPERLIPIDEMIC VETERAN PATIENTS WHO HAVE FAILED PRIOR STATIN OR COMBINATION THERAPY AT THE JESSE BROWN VA MEDICAL CENTER

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BACKGROUND
Coronary vascular disease (CVD) affects more than 14 million people in United States. Elevated low density lipoprotein (LDL) cholesterol is a major risk factor for developing CVD. Numerous studies have shown that reducing LDL to desired goal will decrease the incidence of cardiovascular events and related morbidity and mortality. Statins are first line agents and are commonly used to achieve desired LDL goal. Crestor (rosuvastatin), the most potent statin, is available as a non-formulary agent at Jesse Brown VA Medical Center. It is not widely utilized due to safety concerns of a higher risk of adverse drug reactions such as myalgias, elevated liver enzymes, hepatic failure, and renal impairment. However, recent evidence suggests that rosuvastatin may be as safe as other statins and may provide a better alternative for LDL reduction as well as be used in patients who have failed another statin secondary to adverse events.
PURPOSE
The primary purpose is to evaluate safety and efficacy of rosuvastatin in veterans who failed or did not tolerate one or more lipid lowering therapies prior to approval of rosuvastatin. The secondary purpose is to assess the influence of rosuvastatin on renal function.
METHODS
This study is a retrospective chart review of veterans approved for use of rosuvastatin from November 2003 through September 2006. All veterans will be assessed for incidence of adverse drug events as well as treatments failed prior to the non-formulary approval of rosuvastatin. The following data will be collected: patient demographics, CVD status, CVD risk factors(age, family history, smoking status, obesity, low HDL), coronary artery disease risk equivalents(peripheral artery disease, abdominal aortic aneurysm, diabetes), liver disease, kidney disease, previous therapies used, reason for treatment failure, and baseline and follow up laboratory data regarding fasting lipid profile, liver enzymes, serum creatinine, and calculated glomerular filtration rate (GFR) using MDRD equation.
RESULTS/CONCLUSION
Pending

Learning Objectives:

To describe the role of rosuvastatin in patients who previously failed another statin or other agent, alone or in combination for lipid lowering.

To identify when rosuvastatin may be a better alternative in patients who experience an adverse event with another lipid lowering agent.

Self Assessment Questions:

What makes rosuvastatin different from other statins and how does this affect its use in lipid lowering therapy?

What is the LDL and triglyceride reducing potential of rosuvastatin?

INFORMATION TECHNOLOGY: IMPACT OF DOWNTIME AND RECOVERY TIME ON PATIENT CARE OUTCOMES

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Purpose: Information technologies include devices that manipulate, analyze, store or process information. Information technology refers to the use of software, hardware, networking, and communication applications for the development and integration of these devices. Although these devices are essential components of organizational design to support the delivery of patient care across hospital units, there are no studies addressing the impact of downtime and recovery time on patient care. The purpose of this study is to examine the impact of downtime and recovery time on patient care outcomes.

Methods: Hospital pharmacy directors across the country will be randomly selected to receive the on-line survey consisting of three parts. The first section will elicit responses for demographic characteristics of the hospital. The second section will elicit responses on various types of information technology and time to recover. Lastly, the perceived impact on patient outcomes will be assessed. A multiple linear regression model will be developed to examine the relationship between downtime and recovery time on patient outcomes.

Results/Conclusions: To be presented at the conference.

Learning Objectives:

To discuss the impact of system downtime and recovery time on patient care outcomes.

To discuss strategies for minimizing the impact of downtime and recovery time on patient care outcomes.

Self Assessment Questions:

ASHP supports active participation of pharmacists in medical informatics. T / F

Minimum standards for information technology performance have been defined by regulatory and accreditation agencies. T / F

EVALUATION OF OUTCOMES BEFORE AND AFTER ELECTRONIC MEDICAL RECORD (EMR) AND COMPUTERIZED PHYSICIAN ORDER ENTRY (CPOE) SYSTEM IMPLEMENTATION IN AN OUTPATIENT ONCOLOGY SETTING

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Background:
Computerized physician order entry (CPOE) in electronic medical records (EMR) has been recognized as an important tool in optimal health care provision that can reduce errors and improve safety. The objective of this study is to describe documentation completeness and user satisfaction of medical charts before and after outpatient oncology EMR/CPOE system implementation in a hospital based outpatient cancer center within three treatment sites and with sixteen physicians.
Methods:
A retrospective chart review was conducted on 32 randomly selected patients to date, who received one of the following regimens: FOLFOX, carboplatin-paclitaxel, CHOP-rituximab, or AC between 1999 and 2006. Charts were case matched with physician and regimen to compare documentation completeness. Completeness scores were assigned to each chart based on the number of documented data points found out of the 33 data points assessed. A user satisfaction survey of the paper chart and EMR/CPOE system was conducted among the physicians (n=16), nurses (n=43), and pharmacists (n=8) who worked with both systems.
Results:
The mean percentage of identified data points successfully found in the EMR/CPOE charts was 94% vs. 68% in the paper charts ($p<0.001$). Regimen complexity did not alter the number of data points found. The survey response rate was 64% and the results showed that satisfaction was statistically significant in favor of the EMR/CPOE system. The time required to find the data points will be assessed by having a physician, nurse, and pharmacist review the same charts. Data on 112 charts will be presented.
Conclusions:
Using EMR/CPOE systems improves completeness of medical records and chemotherapy order documentation and improves user satisfaction with the medical record system.

Learning Objectives:

Discuss the differences and similarities of documentation in a paper chart and an EMR/CPOE chart.

Identify areas to improve EMR/CPOE user satisfaction in the outpatient oncology setting.

Self Assessment Questions:

Overall, the mean percentage of identified data points found in the EMR/CPOE charts was higher than in the paper charts. True/False

Overall, clinicians are not satisfied with the EMR/CPOE system. True/False

STRESS ULCER PROPHYLAXIS MEDICATION USE: REDUCING NON-INDICATED USE AFTER HOSPITAL DISCHARGE

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Purpose: reduce the post-discharge use of stress-ulcer prophylaxis (SUP) without an indication.

Methods: A retrospective chart review will be conducted of patients admitted to the intensive care unit (ICU) from November 1, 2006 through January 31, 2007. This study will be performed as a follow-up to a study at our institution which demonstrated that 24.4% of ICU patients are discharged from the hospital with continuing SUP without an indication. Educational presentations and printed tools were used prior to the study period to improve adherence to hospital guidelines for the prescribing and discontinuation of SUP. Medication reconciliation by pharmacists was used to ensure appropriate therapy at discharge. A list of all patients admitted to the ICU during a three month time period was obtained from the APACHE III database. Inpatient prescribing of SUP was identified using the electronic pharmacy order entry system. Electronic and paper records of inpatient and clinic visits were used to assess the appropriateness of continued medication use after discharge. Patients with Zollinger-Ellison syndrome or gastrointestinal bleeding of any kind were excluded from the study. Results will be compared to the study conducted previously. The impact of pharmacists and educational materials on prescribing will be assessed.

Results: Positive feedback has come from physicians and pharmacist about the incorporation of the stress ulcer prophylaxis guidelines into practice. Awareness of appropriate use has increased. Outcomes will be determined.

Learning Objectives:

Understand when stress ulcer prophylaxis medications are indicated.

List ways to prevent the unnecessary use of stress ulcer prophylaxis medications

Self Assessment Questions:

What are the indications for the use of stress ulcer prophylaxis?

List ways pharmacists may reduce the use of unnecessary medications?

EFFECTS OF DEXMEDETOMIDINE ON OPIOID AND BENZODIAZEPINE DOSING REQUIREMENTS IN CHILDREN AFTER CARDIAC SURGERY

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Background
Opioids and benzodiazepines are the cornerstone of pain and sedation management in critically ill children. Dexmedetomidine is a potent and selective alpha2-adrenergic agonist which has sedative, analgesic, and anxiolytic effects. In adults, dexmedetomidine has been shown to decrease dosing requirements of opioids when added to pain and sedation protocols. Limited data have been published regarding dexmedetomidine use in children. However it may be hypothesized that similar to adult data, the addition of dexmedetomidine to standard pain and sedation management protocols in pediatric patients may reduce the overall narcotic and benzodiazepine dosing requirements.
Objective
The objective of this study is to determine any difference in narcotic and benzodiazepine dosing requirements in pediatric cardiovascular surgery patients treated postoperatively with or without dexmedetomidine.
Methods
This is a retrospective cohort study. A computer-generated list of pediatric cardiovascular surgery patients less than 18 years was used to capture both case and control subjects. The case group consists of those patients who received dexmedetomidine postoperatively between January and June 2006, and will be compared to a historical control group of pediatric patients that did not receive dexmedetomidine post-operatively. Baseline demographic and clinical characteristics of the patients in the two groups will be compared. Utilizing the medication administration record cumulative opioid and benzodiazepine dosing requirements for each patient will be evaluated. Opioid dosing will be reported as standardized equivalent morphine doses. Benzodiazepine dosing will be reported as standardized equivalent midazolam doses based on our institutional standard conversion. Dosing requirements between the two groups will be compared to determine the impact of dexmedetomidine on cumulative opioid and benzodiazepine doses.
Results and Conclusions
Results and conclusions are pending and will be presented upon completion of data collection.

Learning Objectives:

Describe the impact of dexmedetomidine use on opioid and benzodiazepine dosing requirements in pediatric patients.

Understand the pharmacologic differences between dexmedetomidine and opioids.

Self Assessment Questions:

Dexmedetomidine is a selective alpha2-adrenergic agonist. T/F

Dexmedetomidine does not have sedative properties. T/F

IMPACT OF MORBID OBESITY ON CLINICALLY SIGNIFICANT HEPARIN INDUCED BLEEDS

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PURPOSE: Therapeutic heparin dosing is typically performed using a weight-based heparin nomogram. However, there is no clear consensus on the appropriate weight to use for dosing morbidly obese patients. The objective of this study is to determine if the odds of clinically significant bleeding is higher in morbidly obese patients compared to non-obese patients when actual body weight is used to dose heparin.

METHODS: This retrospective case control study was approved by IRRB. Case patients were identified through adverse reaction reports generated by the pharmacy department and by medical record codes. Cases of clinically significant bleeding were defined as death due to bleeding, retroperitoneal or intracranial bleeding, or a bleed with a decrease in hemoglobin greater than 2 grams per deciliter or requiring transfusion. Included patients were at least 18 years old and treated with heparin per the institution's nomogram. Exclusion criteria included: heparin used for acute coronary syndrome, cardiac catheterization, acute myocardial infarction, or stroke, heparin discontinued before aPTT therapeutic, or unknown patient height. Patients with significant bleeds were matched to a control group of patients treated with therapeutic heparin who did not have a clinically significant bleed. Patients were then categorized as morbidly obese with a body mass index greater than or equal to 40, or non-obese with a body mass index less than 30. The primary outcome was the odds of clinically significant bleeding in heparinized patients who were morbidly obese compared to non-obese patients. Other predictors of bleeding such as age, length of time on heparin, renal function and indication were isolated and compared between the bleeding and non-bleeding groups as secondary outcomes.

RESULTS/CONCLUSIONS: Data collection is in progress and final results will be presented.

Learning Objectives:

Identify the odds of bleeding when actual body weight is used to dose heparin in morbidly obese patients.

Discuss the risk factors for bleeding while receiving therapeutic heparin.

Self Assessment Questions:

T or F Heparin's volume of distribution is similar to blood volume.

What patient characteristics may increase the risk of bleeding while on heparin?

DEVELOPMENT OF A BUSINESS PLAN FOR THE IMPLEMENTATION OF A CENTRALIZED REFILL PHARMACY SOLUTION

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Background: The University of Wisconsin Hospital and Clinics (UWHC) continues to look for novel ways to enhance operations and improve patient satisfaction. One method to facilitate these goals is through a centralized refill solution. The purpose of this project is to develop a business plan and assess the necessary requirements needed for the implementation of a centralized refill solution.

Methods: A SWOT analysis, review of prescription volumes, and a return on investment analysis for the purchase of robotic dispensing systems (RDS) and an integrated pharmacy information system with point of sale (POS) cash registers will be performed. The location of the centralized refill pharmacy solution will then be determined. Own use vs. non-own use contract pricing will be evaluated as well as labor costs per prescription.

Federal and State laws will be reviewed to ensure legal compliance with subsequent development of UWHC Policies and Procedures.

Results: Approximately 50% of all outpatient prescription volume is refills, with 75% of those medications having the potential to be placed in the RDS.

State and Federal laws were reviewed. They require voluntarily enrollment, quality assurance and improvement plans for both the central refill pharmacy and originating pharmacy.

UWHC has selected and purchased two robots which will be implemented at two separate pharmacies due with different classes of trade. Implementation of the first robot is scheduled for March 2007. The integrated pharmacy information system with POS has been narrowed down from nine vendors to two finalists with site visits pending.

An analysis of the current delivery system and mail order logistics is under way, and an automatic refill authorization form has been developed and is being piloted.

Conclusion: Further evaluation of operational processes will continue, and the business plan will be finalized.

Learning Objectives:

Describe essential components to a centralized pharmacy refill solution

Understand the financial implications of opening a centralized pharmacy refill solution

Self Assessment Questions:

T/F: A centralized pharmacy refill center is a viable option for every institution

Which of the following is critical to a centralized pharmacy refill center?

A) Central patient profile
B) Automated dispensing technology
C) Quality improvement initiatives
D) None of the above
E) All of the above

IMPACT OF EVIDENCE-BASED WARFARIN PRESCRIBING PRACTICES IN A COMMUNITY TEACHING HOSPITAL

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Purpose

Based upon The Institute for Healthcare Improvement (IHI) initiative, "Protecting 5 Million Lives from Harm", hospitals are encouraged to adopt proven interventions to reduce medical errors. One new IHI initiative involves providing safe use of high-risk medications including anticoagulants. The existing anticoagulant guideline for Riverside Methodist Hospital was developed and distributed in 1999. This project aims to evaluate the use of oral anticoagulants within the institution, update the existing guidelines to reflect current standard practices, and provide resources and education to the medical staff, nursing, and pharmacy to provide evidence-based care to patients and prevent serious adverse events from oral anticoagulant use.

Methods

A literature review was completed to evaluate standards of practice for warfarin use and reversal of toxicity. The existing guidelines were updated and published with P&T approval. A random retrospective chart review of 50 patients from December 2006 was conducted prior to implementing the updated guidelines to assess initial prescribing practices. Based upon the size of the institution, the guidelines were distributed on a general medicine unit with education provided for medical staff, nursing, and pharmacy. A second retrospective chart review will be completed to quantify outcomes and assess the impact of the information provided on physician prescribing.

Results

Data collection is in process. Results from the study will be presented at the conference.

Conclusion

High-Risk medications are those which are most likely to cause significant harm to the patient, even when used as intended. Each institution must be aware of its use of high-alert medications, including warfarin, and routinely examine its concordance with published, evidence-based medical practices to ensure quality patient care.

Learning Objectives:

Review of the literature pertaining to warfarin dosage and reversal.

Understand the obstacles and limitations to implementing a system-wide guideline for warfarin use.

Self Assessment Questions:

T/F Subcutaneous Vitamin K has the best predictability and is recommended as an agent to reverse a supratherapeutic INR.

T/FWhen implementing new medication guidelines, it is necessary to evaluate the clinical impact of the change.

DRUG AND DEVICE DEVELOPMENT: DESIGNING, COORDINATING, AND EVALUATING A MULTIDISCIPLINARY ELECTIVE COURSE

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Purpose:

During undergraduate pharmacy education, many schools do not have time in the core curriculum to fully address the drug and device development process. Thus, pharmacists interested in working in industry or in clinical research must gain a working knowledge of the development process before becoming an effective team member in the development of new medical products. In drug and device development, there is a need for teamwork among many different professions in order to proceed through the development process. By providing the background and basic principles, a multidisciplinary elective course will allow students to better understand the process, utilize data discovered in drug and device development, and to appreciate what various professions can offer when developing a drug or device.

Methods:

A two-credit hour, 16-week elective course was created for upper-level students in pharmacy, nursing, health sciences, and engineering. Course topics included preclinical research, clinical studies (Phase I, II, III, and IV), IND and NDA. In addition, topics such as human research subject protection, generics, OTC products, and financial concerns were discussed to illustrate differences in the development process for various types of medical products. Most of the instructors were clinical researchers, who brought real-life experience into the course. As there were multiple instructors, the course coordinator communicated with all instructors to minimize duplication of effort and gaps in the material. Student assessment methods included class participation, homework assignments, in-class debates, and quizzes. Evaluations of each of the instructors, each topic, and the course as a whole were administered via online course management software. This course was offered during the Spring 2007 semester at Purdue University.

Results:

Details of the course structure, syllabus, course content, grading criteria, homework assignments, and evaluation results will be presented at the 2007 Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Identify concepts in the discovery and development process that should be covered in a drug and device development course.

Recognize the benefits of understanding the discovery and development process, and how it can apply to multiple career options.

Self Assessment Questions:

Which course topics did the students feel were the most beneficial or would be the most useful to them in their future careers?

What activities did the students feel were most helpful to them in learning the course content?

EVALUATION OF PRIMARY CARE MANAGEMENT FOR HIV PATIENTS FOLLOWED IN AN INFECTIOUS DISEASE CLINIC

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Purpose: Since the advent of highly active antiretroviral therapy for Human Immunodeficiency Virus (HIV), patient life expectancy has increased dramatically. This has lead to an increase in the number of HIV-positive patients over 50 years old. Antiretroviral agents can also have a variety of metabolic side effects. For these reasons, treating comorbid conditions such as diabetes mellitus (DM), hypertension (HTN), and coronary artery disease (CAD) has become increasingly important. At the Louis Stokes VAMC, the Infectious Disease (ID) providers manage both the patients' HIV and their primary care conditions. This study is an evaluation of how thoroughly ID providers are complying with monitoring and treatment recommendations in established guidelines for DM, HTN, and CAD. An additional objective is to determine what patient specific factors (e.g. substance abuse or homelessness) may be a barrier to effective monitoring or treatment of these primary care conditions.
Methodology: The study is a retrospective chart review. Patients were included if they are HIV-positive and have at least one of the following conditions: DM, HTN, and/or CAD. For patients with DM, outcomes include the number of hemoglobin A1c, urine microalbumin, and fasting lipid panel measurements as well as A1c, blood pressure, and LDL goal attainment. Other outcomes include whether eye and foot exams were done and daily aspirin use. For patients with HTN, outcomes include goal blood pressure attainment and class(es) of antihypertensives used. In patients with CAD, outcomes include LDL goal attainment, goal blood pressure attainment, and daily aspirin use.
Results: All 78 patients meeting inclusion criteria were reviewed. In patients with DM, 63% met the A1c goal, 42% met the LDL goal, and 21% met the blood pressure goal. The LDL goal was met in 67% of patients with CAD, and 44% of patients with hypertension reached their goal blood pressure.
Conclusion: Pending

Learning Objectives:

Summarize the level of goal attainment in HIV-positive patients with DM, HTN, and CAD treated by the ID clinic at the Louis Stokes VAMC

Identify the patient characteristics that are barriers to effective monitoring and treatment of primary care conditions

Self Assessment Questions:

Why is it important to treat conditions such as DM, HTN, and CAD in patients with HIV?

T of F: Most patients with DM had a urine microalbumin measurement within the past year.

EVALUATION OF RAPID INFUSION OF RITUXIMAB IN A CANCER CENTER

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Purpose:
Rituximab is widely used as monotherapy or in combination with chemotherapy for hematologic malignancy treatment. However, it is often associated with infusion-related reactions. It may take 4 to 6 hours to complete the infusion according to manufacturer's recommendation. Some patients may need to return the next day to complete other combination chemotherapy, which leads to inconvenience. Some preliminary studies at the American Society for Hematology meeting showed that rapid rituximab infusion can be safely given to patients, who well tolerated a prior treatment, without compromising patients' safety. A rapid infusion protocol was developed and approved by the Pharmacy and Therapeutics Committee at the Barbara Ann Karmanos Cancer Center (KCC) in September 2006. This protocol allows subsequent rituximab infusions to be completed within 2 hours in patients without infusion-related reactions from the first cycle.

Methods:
This is a retrospective study to evaluate the safety outcomes of rapid rituximab infusion protocol. A pharmacy database is used to identify patients between 18 and 89 years of age, who received rituximab infusions at KCC from July 2006 to present. Patients who received standard subsequent infusions will serve as the control group in this study. The following data are collected from medical record review: patient age, gender, height, weight, body surface area, diagnosis, number of cycle and dosage of rituximab, rapid infusion (yes/no), blood pressure pre- and post-infusions, chemotherapy regimens, use of steroids and occurrence of hypersensitivity or infusion-related reactions (fever, chills, rigors, bronchospasm and hypotension). The rate of patients completing rapid infusion will be analyzed. Safety outcomes will be assessed by incidence and severity of infusion-related reactions. The number of patients receiving rituximab with combination chemotherapy on the same day will also be evaluated.

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

Learning Objectives:

Discuss the rationale of utilizing a rapid rituximab infusion protocol in a cancer center.

Describe the possible infusion-related reactions associated with rituximab infusion.

Self Assessment Questions:

The developed protocol at Karmanos Center Center allows patients without infusion-related reactions from the first cycle to complete a rituximab infusion within 2 hours. True or False

Infusion-related reactions can be presented as headache, fever, chills, rigors, sweats, hypotension, and bronchospasm. True or False

TRENDS IN AMIODARONE LABORATORY MONITORING IN A VA HOSPITAL FOLLOWING THE IMPLEMENTATION OF COMPUTERIZED CLINICAL REMINDERS

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Purpose: Amiodarone is an agent associated with an extensive adverse event profile, which necessitates close monitoring. In January 2003, results of an internal quality improvement report at the Hines VA Hospital and its affiliated community based outpatient clinics indicated that only 6% of sampled patients fulfilled all amiodarone monitoring criteria based on the North American Society of Pacing and Electrophysiology guidelines. To improve adherence, a computerized clinical reminder system was established.

The primary objective of this study is to determine if there is a significant difference in the proportion of patients who received all defined safety monitoring for amiodarone before and after implementation of the clinical reminders. Secondary objectives include: subgroup analyses on the basis of amiodarone dosage and determination of whether the effect of the clinical reminders diminished over time.

Methods: This is a retrospective cohort study consisting of laboratory data extraction for all patients newly started on amiodarone during two date ranges: October 4, 2002 through October 4, 2003 (pre-intervention) and October 5, 2004 through October 5, 2005 (post-intervention). Outcome measures (extracted from the electronic medical records) include liver function tests (LFT), thyroid function test (TFT), electrocardiogram (ECG), pulmonary function test (PFT), and Chest X-ray. Patients' medical records will be queried to extract dates of the outcome measures spanning from 1 month before the index date through 13 months after the index date. The date of the first prescription fill for each patient will be the index date. The percentage of patients receiving appropriate monitoring will be compared before and after introduction of the clinical reminders. Outcome measures will be compared between groups using chi-square analysis. Logistical regression will be performed to adjust for intergroup variation.

Results and Conclusions: Data analysis in ongoing. The results and conclusions of this study will be presented at the Conference.

Learning Objectives:

To describe the appropriate parameters/intervals to monitor for adverse events associated with amiodarone therapy.

To describe the impact of a computerized clinical reminder system on amiodarone safety monitoring within a VA hospital.

Self Assessment Questions:

Amiodarone is associated with a variety of adverse events including pulmonary and cardiovascular toxicities. True/ False

The North American Society of Pacing and Electrophysiology (NASPE) guidelines suggest the following amiodarone safety monitoring:
a.Chest x-ray every month.
b.Thyroid function testing at baseline and every 6 months.
c.Pulmonary function testing every month.
d.A and B
e.B only

EVALUATION OF RIFAXIMIN UTILIZATION FOR HEPATIC ENCEPHALOPATHY IN A TERTIARY ACADEMIC MEDICAL CENTER

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Background/Purpose: Hepatic encephalopathy (HE) is a potentially reversible neuropsychiatric syndrome occurring in patients with acute or chronic liver disease. HE is characterized by alterations in consciousness, personality, intellect and neuromuscular activity. Ammonia accumulation plays a central role in the pathogenesis of HE. Degradation of nitrogenous compounds by aerobic and anaerobic bacteria in the intestine contributes to the production of ammonia. Current treatment options focus on inhibition of ammonia generation, reduction of its intestinal absorption and facilitation of its elimination. Administration of non-absorbable disaccharides such as lactulose remains the pharmacologic treatment of choice for HE. However, lactulose use is associated with a high incidence of side effects including nausea, vomiting and diarrhea. Rifaximin, a non-systemic antibiotic with activity against gram-positive and gram-negative aerobic and anaerobic bacteria offers an alternative option due to its low incidence of side effects. The purpose of this evaluation is to characterize the utilization and efficacy of rifaximin for HE.

Methods: This evaluation is a retrospective, observational analysis of approximately 60 adult patients, who received rifaximin during their hospitalization between July 2006 and December 2006. Exclusion criteria include pregnant women and prisoners. A report will be generated to identify all patients who received rifaximin during the selected period. Data regarding each patient's rifaximin use will be collected for their entire stay. This evaluation was determined to be exempt from IRB review. The following admission data will be collected: age, weight, gender and grade/etiology of liver cirrhosis. Ammonia levels and symptoms of HE will be evaluated in order to help determine the efficacy of rifaximin. The occurrence of adverse effects associated with lactulose administration before and after the addition of rifaximin will also be examined. Descriptive statistics will be used to evaluate and summarize the collected data.

Results: Results and conclusions will be presented at the conference

Learning Objectives:

Evaluate the efficacy of rifaximin for hepatic encephalopathy in an academic medical center using ammonia levels and assessing symptoms of HE.

Identify the occurrence of intolerable adverse effects associated with lactulose administration prior to and after the addition of rifaximin to a patient's drug regimen.

Self Assessment Questions:

Both neomycin and metronidazole have been used in the treatment of hepatic encephalopathy with minimal adverse events. T or F

The portal-systemic encephalopathy (PSE) index is used to assess the severity of hepatic encephalopathy by measuring only blood ammonia concentration and an EEG mean cycle frequency. T or F

EVALUATION OF PERIPROCEDURAL ANTICOAGULATION MANAGEMENT IN TWO PHARMACIST-MANAGED ANTITHROMBOSIS CENTERS

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Purpose:
The management of patients requiring long-term oral anticoagulation needing to undergo surgery or invasive procedures is a common clinical predicament. The purpose of our research is to evaluate current periprocedural anticoagulation management in both community hospital and university hospital-based antithrombosis centers within The Health Alliance. This research will also evaluate post-procedure event rates in patients who require interruption of anticoagulation therapy. The goal is to develop a protocol for periprocedural anticoagulation management to be implemented in all Health Alliance pharmacist-managed antithrombosis centers.

Methods:
This project is a retrospective chart review of patients participating in The University Hospital and St. Luke West Pharmacy Antithrombosis Clinics who required interruption in their warfarin therapy from January 2006 through July 2006. The primary outcome of this study is to evaluate periprocedural anticoagulation plan development amongst pharmacy antithrombosis clinics within our health system. Secondary outcomes include evaluating 30-day post-procedure event rates in patients who require interruption of anticoagulation therapy and determining for what types of procedures is anticoagulation being interrupted.

Specific data related to a patient's interruption of anticoagulation therapy will be collected, and includes but is not limited to the following: age, indication for anticoagulation, date and type of last thrombotic event, physician/pharmacist preparing periprocedural anticoagulation plan, and type of procedure. This data will then be analyzed using descriptive statistics.

Preliminary Results:
As of February 1st, 609 patients from St. Luke West and 341 patients from University Hospital were identified as visiting these respective clinics during the period of January 1st 2006 through June 30th 2006. Patients who required interruption of anticoagulation therapy during these periods are currently being identified and evaluated.

Conclusions:
Research is currently in progress, therefore no conclusions can be made at this time.

Learning Objectives:

Discuss the controversy behind periprocedural anticoagulation management

Review the thromboembolic (TE) risks associated with interrupting anticoagulation

Review the thromboembolic (TE) risks associated with interrupting anticoagulation

Self Assessment Questions:

The risk of stroke in patients with atrial fibrillation increases with age. True or False

The risk of recurrence in patients with a history of venous thromboembolism is lower in patients with cancer. True or False

TOLERABILITY AND PRESCRIBING PATTERNS OF LEVETIRACETAM IN PATIENTS WITH TRAUMATIC BRAIN INJURY.

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Background: Prophylactic use of anti-epileptic drugs following traumatic brain injury has been shown to reduce the risk of early-seizures (seizures within the first seven days following injury). The Brain Trauma Foundation head injury guidelines support the use of seizure prophylaxis for a period of seven days following injury. Although phenytoin has been shown to be effective, its side effect profile and narrow therapeutic range make it a less than ideal medication. Levetiracetam is an attractive option for post-traumatic seizure prophylaxis because therapeutic drug monitoring is not needed and it has a minimal side effect profile.

Purpose: The purpose of this study is to compare the tolerability, prescribing patterns and outcomes in patients who are prescribed levetiracetam following initial therapy with phenytoin versus those prescribed phenytoin only for seizure prophylaxis following traumatic brain injury.

Methods: This study is a retrospective chart review of patients admitted to the intensive care unit for traumatic brain injury receiving seizure prophylaxis from January 2004 to December 2006. Adult patients admitted to the intensive care unit who received either phenytoin or levetiracetam will be included. Patients are excluded if they were taking levetiracetam or phenytoin prior to admission or have a history of epilepsy or traumatic brain injury. The following data are being collected: injury severity, incidence of side effects, seizures, reason for switch to levetiracetam, length of therapy, Glasgow Coma Scale, appropriate labs, Glasgow Outcome Scale at discharge and demographic data. Levetiracetam patients are compared to patients receiving phenytoin during the same time period. Data are being collected from time of admission until hospital discharge.

Results/Conclusions: Data collection in progress. Results to be presented at conference.

Learning Objectives:

Evaluate the literature supporting the use of post-traumatic seizure prophylaxis.

Compare the side effect profiles of phenytoin and levetiracetam.

Self Assessment Questions:

T/F The literature supports using anti-epileptic medications beyond seven days following traumatic brain injury.

List 3 common side effects of levetiracetam.

EFFICACY AND SAFETY OF COMBINATION BUPROPION AND VARENICLINE, A PARTIAL AGONIST OF NICOTINIC ACETYLCHOLINE RECEPTORS, IN THE TREATMENT OF SMOKING CESSATION IN A VETERANS' POPULATION

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Purpose: This study will determine if combination varenicline and bupropion therapy is more efficacious than the combination of bupropion and nicotine transdermal patches. The secondary objective of the study will be to determine the rates of known adverse effects associated with these agents when used in combination.

Methods:
Veterans referred to the Zablocki VA Medical Center smoking cessation clinic will be given the option of participating in this open label, prospective study. Veterans who choose to participate will receive the treatment of varenicline and bupropion, along with the education and group support given to all smoking cessation program participants. Veterans who choose not to participate in the study will receive the standard treatment, which is bupropion and nicotine transdermal patches, along with the same education and group support. Varenicline doses will be started at 0.5mg daily, and titrated up, as tolerated, to the maximum dose, 1mg twice daily. Bupropion SA doses will be started at 150mg daily and titrated, as tolerated, up to the maximum dose of 150mg twice daily. Efficacy, defined as smoking abstinence verified by carbon monoxide testing, will be documented at each support meeting, and at one year. Safety, defined as the incidence of adverse reactions, will be documented for all medications at each support meeting. At each of these times, participants will fill out a questionnaire which asks participants about the type and frequency of side effects.

Results: Results are pending, and initial results will be presented at the Great Lakes Pharmacy Residency Conference in April, 2007.

Learning Objectives:

Discuss the common side effects associated with varenicline pharmacotherapy.

Describe the mechanism of action of varenicline.

Self Assessment Questions:

List three of the most common side effects associated with varenicline.

True or False: The mechanism of action of varenicline is similar to that of bupropion.

ETOMIDATE INFUSION FOR HYPERCORTISOLEMIA SECONDARY TO AN ADRENOCORTICOTROPIC HORMONE (ACTH) PRODUCING LUNG TUMOR: A CASE PRESENTATION AND REVIEW OF THE LITERATURE

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Statement of Purpose: To report a case of hypercortisolemia secondary to an ACTH producing lung tumor treated with an infusion of etomidate.

Statement of Methods Used: Case Summary: A 71 year old white female with a left hilar lung mass presented to the ED with a chief complain of hyperglycemia and weakness. Her past medical history included Type 2 diabetes, chronic obstructive pulmonary disease, coronary artery disease, angioplasty, pacemaker placement, hypertension, and hyponatremia. She became severely hypoxic, requiring mechanical ventilation. Hypercortisolemia secondary to an ACTH producing lung tumor was treated with an etomidate infusion (80mg/250ml D5) at 0.3mg/kg/hr for approximately four days before life support was withdrawn.

Summary of results to support conclusion: An infusion of etomidate in a mechanically ventilated patient successfully decreased cortisol and ACTH levels. Etomidate infusion of 24 mg/h (0.3mg/kg/hr) decreased serum cortisol from > 60 mcg/dL to 15.6 mcg/dL. ACTH levels prior to initiation of etomidate infusion were 289 pg/mL. Post etomidate ACTH were not available.

Conclusions reached: Our case report and others from the literature suggest that administration of intravenous etomidate may be appropriate in ventilated patients experiencing hypercortisolemia due to ectopic ACTH producing tumors.

Learning Objectives:

1. Review the signs, symptoms and treatment options for hypercortisolemia secondary to ACTH producing tumors.

Describe the role of etomidate in hypercortisolemia.

Self Assessment Questions:

1. Which of the following accurately describes the mechanism of action for etomidate?
A. Adrenal 11--hydroxylase inhibitor
B. Ultrashort non-barbiturate hypnotic
C. Imidazole intravenous anesthetic
D. A and B only
E. All of the above

2. True of False? Small-cell lung carcinoma is the most frequent source of ectopic ACTH producing tumors.

ARGATROBAN DOSING AND ADVERSE EFFECTS IN PATIENTS WITH CONFIRMED OR SUSPECTED HEPARIN-INDUCED THROMBOCYTOPENIA: A SINGLE-CENTER RETROSPECTIVE ANALYSIS OF CRITICALLY ILL AND NON-CRITICALLY ILL PATIENTS

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Heparin induced thrombocytopenia (HIT) is strongly associated with new thrombotic events. The use of a direct thrombin inhibitor may be necessary in the management of these patients. Critically ill patients may require argatroban dosages lower than those recommended by the FDA. The primary objectives of this study are to compare the differences in therapeutic argatroban dosage and associated bleeding events between critically ill and non-critically ill patients.

The University Hospital's pharmacy billing database identified patients charged for at least one dose of argatroban within 3 years. Those who received argatroban for at least 24 hours will be included. Patients with severe hepatic impairment (Child-Pugh Grade C) at initiation of argatroban, recent liver transplant, and age < 18 years will be excluded. The following data will be collected at baseline and throughout treatment: PT/INR, aPTT, platelets, hemoglobin and hematocrit, BUN, serum creatinine, AST, ALT, alkaline phosphatase, and total bilirubin. Concomitant use of antiplatelet medications also will be collected. The primary comparison points between critically ill and non-critically ill patients are: argatroban starting dose; time to therapeutic aPTT (1.5 to 3 times baseline aPTT, not exceeding 100 sec); time within therapeutic range (defined as 1.5-3 times baseline aPTT); time above or below therapeutic range (defined as aPTT less than 1.5 baseline or > 100s); and argatroban dosage required to maintain a therapeutic aPTT. Adverse events including death during hospitalization, amputation secondary to HIT, new thrombosis, and major bleeding will be compared. Additionally, a predictive model for optimum starting dose and a titration schedule (i.e. change in dosage related to % change in PTT) for argatroban will be evaluated.

Learning Objectives:

Review the importance of anticoagulation in patients with heparin induced thrombocytopenia.

Define appropriate argatroban dosing strategies in critically ill and non-critically ill patients.

Self Assessment Questions:

Based on most estimates, HIT has an associated mortality rate of:
a.5%
b.10-30%
c.50-65%
d.100%

True or False: The FDA-approved starting dose for use of argatroban for HIT in patients without hepatic impairment is 0.5 mcg/kg/min.

IMPACT OF AN AMBULATORY PHARMACEUTICAL CARE SERVICE ON BLOOD PRESSURE IN PATIENTS WITH UNCONTROLLED UNCOMPLICATED HYPERTENSION RECEIVING PRIMARY CARE IN REGIONAL CLINICS.

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Purpose: The purpose of this study is to evaluate the impact of a pharmaceutical care service on blood pressure (BP) in patients with uncontrolled uncomplicated hypertension.

Methods: This study is a 6-month prospective randomized controlled clinical trial to compare BP outcomes between a pharmaceutical care service and usual medical care. Patients with complicated hypertension (concurrent diagnosis of congestive heart failure, kidney disease, or diabetes) were excluded. The pharmaceutical care intervention involves two face-to-face appointments with the pharmacist at 0 and 3 months and a minimum of three follow-up calls after each appointment. Pharmacist activities during pharmaceutical care appointments include reviewing each medication for indication, safety, effectiveness, and convenience, evaluating medication adherence, educating the patient, and developing and documenting a care plan. Suggestions for drug therapy improvement are communicated with the primary care provider and documented in the patient's permanent electronic medical record.

Preliminary Results: 193 potential study participants were identified. Forty-six (24%) of these were excluded. Thirty-four of the 147 recruitable patients (23%) were randomized to control, 39 (27%) refused participation, and 22 (15%) volunteered for the study.

Conclusions: Data collection is still in progress. Results and conclusions will be presented at the 2007 Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Describe the incidence of uncontrolled hypertension and list its consequences.

Quantify the impact of an ambulatory pharmaceutical care service on uncontrolled uncomplicated hypertension.

Self Assessment Questions:

The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC-7) illustrates that uncontrolled hypertension is a significant public health concern. True or False?

Which of the following strategies for improving blood pressure control can pharmacists provide through pharmaceutical care:
A. focusing on patient adherence
B. bloodletting
C. overcoming clinical inertia
D. A and C
E. none of the above

APPROPRIATE LIPID MONITORING ACCORDING TO CONSENSUS GUIDELINES FOR PATIENTS TREATED WITH ZIPRASIDONE (GEODON) OR ARIPIPRAZOLE (ABILIFY)

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Background: The utilization of antipsychotic medication is common for treatment of many psychiatric conditions at the VA. The earlier antipsychotic medications are considered effective for treating positive symptoms of psychosis. However their efficacy against negative symptoms is lacking, not to forget they produce unwanted side effects. To reduce such adverse effects the atypical antipsychotics were developed. They too have been known to cause their own set of side effects like hyperlipidemia, type II DM, and weight gain. Currently, clozapine and olanzapine appear to have the greatest association with hyperlipidemia while ziprasidone and aripiprazole have the least. A MEDLINE review conducted by the VA PBM and medical advisory panel concluded that second generation antipsychotics are associated with weight gain and metabolic changes. Due to insufficient data no conclusions can be made about ziprasidone and aripiprazole and their effects. An addendum was added recommending baseline and periodic monitoring of weight, body mass index, fasting blood glucose, lipids and blood pressure. A second addendum was added reiterating the findings of a Consensus guidelines.

Methods: A retrospective study will be performed at the NCHVAMC, analyzing patients who started treatment with either ziprasidone or aripiprazole between the period of January 2005 to December 2005 for schizophrenia, schizoaffective, or bipolar disorder. Data will not be obtained until approval from the Institutional Review Board is granted; the research team will consist primarily of a pharmacy practice resident and a clinical pharmacist whose emphasis is psychiatry. Primary outcome is to determine the percentage of patients meeting inclusion criteria that have lipid monitoring performed in accordance with the Consensus guidelines. Secondary outcomes include discovering changes from baseline in TC, LDL, HDL, and TG.

Results/Conclusion: The results and conclusion will be presented at Great Lakes Pharmacy Resident Conference.

Learning Objectives:

To identify common side effects associated with ziprasidone and aripiprazole specifically dyslipidemia.

To recognize importance of lipid monitoring for all patients being treated with ziprasidone and aripiprazole.

Self Assessment Questions:

T/F A lipid panel should be obtained every 3 months when initiating therapy with any atypical antipsychotic.

T/F Dyslipidemia is the only significant adverse effect caused by ziprasidone and aripiprazole.

EVALUATION OF NEPHROTOXICITY ASSOCIATED WITH TWO AMINOGLYCOSIDE DOSING STRATAGIES IN A HEMATOLOGY/ONCOLOGY POPULATION

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Purpose: Aminoglycosides are commonly used to combat infections in the hematology/oncology population, however, the use of conventional versus extended interval dosing in this population have been scantily defined. The objective of this study is to evaluate the toxicity and efficacy of conventional vs. extended interval aminoglycoside dosing in the hematology/oncology population.

Methods: This is a prospective, randomized, open-label trial conducted in a university hospital. Patients requiring aminoglycoside treatment with tobramycin or amikacin will be randomized to an extended interval or conventional dosing schedule. The extended interval schedule defined as amikacin 15mg/kg or tobramycin 7mg/kg adjusted by the Hartford Hospital nomogram. Conventional dosing defined as amikacin 7.5mg every 12 hours or tobramycin 3mg/kg every 12 hours. Primary outcome will be the occurrence of nephrotoxicity defined by an increase in serum creatinine of > 0.5mg/dl from baseline or a decrease in urine output defined as less than 50ml/hr during aminoglycoside therapy. Secondary outcomes will be to evaluate efficacy using pharmacokinetic parameters in patients with a documented infection. Nephrotoxicity between the two dosing strategies will be evaluated with renal function and/or urine output will be analyzed using an unpaired t-test. Efficacy defined by pharmacokinetic principles and parameters will be evaluated using descriptive statistics.

Results/Conclusion: Data collection is ongoing, final results and conclusion will be presented at the conference.

Learning Objectives:

Identify factor(s) associated with aminoglycoside nephrotoxicity.

Be able to discuss the rationale for the different dosing strategies of aminoglycosides.

Self Assessment Questions:

What are risk factors for the development of aminoglycoside associated nephrotoxicity?

The Infectious Disease Society of American recommends that patients with febrile neutropenia receive extended interval aminoglycoside dosing? T/F

ASSESSMENT OF MEDICATION USE IN RELATION TO INPATIENT FALLS IN OLDER ADULTS

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Beers Criteria for Potentially Inappropriate Medication Use in Older Adults states that older patients need special consideration when using certain classes of medications. The American Geriatrics Society Guidelines for Fall Prevention in Older Adults list physical and functional assessment criteria for patients at risk for falls. Preventing inpatient falls has become an important regulatory issue due to the 2007 Joint Commission on Accreditation of Healthcare Organizations National Patient Safety Goal #9. The objective is to determine if the Beer's Criteria of medication classifications and the patient manifested fall risk components contribute to falls in an inpatient setting.

Clarian Health Partners' electronic incident reporting system was used to identify older patients on the oncology, behavioral health and medical services who experienced a fall resulting in injury between the dates of January 1, 2005 and July 31, 2006. The following data was collected: age, gender, ethnicity, co-morbidities, pertinent physical examination findings, and current medications. Healthcare documentation was evaluated to establish the extent of the medication contributions and physiological variables within 24 hours of the fall. The research team consisted of a pharmacist and a nurse who reviewed medical record documentation and were not involved in the patients' care.

Forty one patients on the selected units experienced a fall resulting in injury. Preliminary results of the medication use evaluation showed 98% (40/41) of patients were receiving 4 or more medications, with 60% (25/41) receiving one or more antihypertensive medications and 49% (20/ 41) receiving a short-acting benzodiazepine. Based on the results, a patient care team "rounding tool" will be developed that will be generated via an electronic medical record system when a patient presents with variables related to high fall risk potential. The "rounding tool" will alert the care team to the fall risk potential so medication and nursing interventions can be employed.

Learning Objectives:

Describe the incidence of falls in older adults prescribed medications potentially inappropriate for use according to Beer's Criteria.

Describe the medication classes and patient manifested fall risk components contributing to inpatient falls.

Self Assessment Questions:

Guidelines for preventing falls in older adults include a physical assessment and a medication review. True or False

Preventing falls is a patient safety initiative according to Joint Commission on Accreditation of Healthcare Organizations. True or False

EVALUATION OF GOAL ATTAINMENT IN DIABETIC GERIATRIC PATIENTS WITH OR WITHOUT MEDICARE PART D

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Objectives:
The primary objective of this study is to assess patients' clinical status of diabetes before and after decision to enroll in Medicare Part D. The secondary objective is to assess patients' satisfaction of their decision to enroll or not enroll into the Medicare Part D program.

Methodology:
Patients 65 years or older were enrolled in the study and administered a Medicare Part D satisfaction survey by pharmacists from December 2006 through February 2007. Upon completion of the survey, a retrospective chart review was completed in diabetic patients who were or were not enrolled in Medicare Part D to assess goal attainment of HbA1c, LDL and blood pressure.

Results:
Preliminary results show that 76% (25/33) of patients surveyed have enrolled into the Medicare Part D program, including patients who have dual eligibility. Of the patients who enrolled into Medicare Part D, 68% (17/25) reported satisfaction with their prescription coverage. Of the patients with diabetes who enrolled in Medicare Part D, no patients experienced improvement in achieving goal HbA1c after enrollment, 6% (1/17) experienced improvement in achieving goal LDL after enrollment, and 29% (5/17) experienced improvement in achieving goal blood pressure after enrollment. Four patients who did not enroll into Medicare Part D were identified as having diabetes. Of these patients, 50% (2/4) met goal HbA1c after enrollment. Fifty percent (2/4) also achieved goal LDL or remained at goal LDL after enrollment, and 25% (1/4) achieved goal blood pressure after enrollment.

Conclusions:
Survey results thus far show satisfaction with patients' decisions to enroll in Medicare Part D. Clinical data shows that a patient's ability to achieve clinical goals in their diabetes management did not appear to differ based on Medicare Part D enrollment.

Learning Objectives:

To describe the trend in satisfaction level of Medicare Part D amongst patients enrolled in Medicare Part D.

To evaluate the impact of Medicare Part D on the management of diabetes.

Self Assessment Questions:

T/F Medicare Part D guarantees lower prescription drug costs and increases access prescription medications.

T/F Majority of the patients who have dual eligibility are satisfied with having Medicare Part D.

THE IMPACT OF A PHARMACIST-MANAGED SPIRONOLACTONE LABORATORY PROTOCOL ON THE RATES OF LABORATORY MONITORING AND HYPERKALEMIA: A PRE- AND POST- INTERVENTION STUDY

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Background/purpose: Since the publication of the RALES trial, spironolactone prescription rates have increased four-fold and hyperkalemia-related hospitalizations and mortality have each increased almost three-fold. Although collaboration between physicians and pharmacists has been shown to improve laboratory monitoring, the impact of this collaboration technique has not been studied. The objectives of this study are to determine if a pharmacy intervention can increase the rate of laboratory monitoring, reduce the rate of hyperkalemia, and reduce the rate of hyperkalemia-related hospitalizations in patients taking spironolactone for chronic heart failure (CHF).

Methods: This is a single-center, 2-phase (pre/post) study. Phase I will be a retrospective analysis (January 1, 2006 to December 31, 2006) to assess the current rates of each of the study endpoints under usual care. Phase II will be a prospective analysis (January 1, 2007 to December 31, 2007) to assess the impact of a new pre-approved pharmacist-managed spironolactone laboratory monitoring protocol on each of the study endpoints. Through a collaborative agreement between the primary care physicians (PCP) and the clinical pharmacists at the study location, both groups will have laboratory ordering privileges for CHF patients treated with spironolactone. Abnormal serum potassium and serum creatinine values will be sent to both the clinical pharmacists and the patient's PCP. The clinical pharmacists will be responsible for managing the patient's spironolactone-related drug therapy. Rates of hyperkalemia (moderate and severe) and spironolactone-related laboratory monitoring will be assessed via an electronic medical record database. Rates of hospitalizations due to hyperkalemia will be determined via International Classification of Diseases (ICD-10) codes included in hospital discharge records for all study patients requiring hospitalization at any time during the course of the study. Statistical analysis will be conducted using SPPP. Nominal and continuous data will be analyzed using the McNemar test and paired t-test, respectively.

Results/conclusion: pending

Learning Objectives:

Describe the impact of spironolactone on the rates of hyperkalemia-related hospitalization and mortality.

Determine the appropriate laboratory monitoring parameters and frequency associated with the use of spironolactone in CHF patient as outlined in the 2005 ACC/AHA guidelines.

Self Assessment Questions:

T or F: Since the publication of the RALES trial, rates of hospitalization and mortality due to hyperkalemia have increased in patients treated with spironolactone.

In CHF patients treated with spironolactone (maintenance therapy), potassium and serum creatinine should be monitored a minimum of:
a. 14 days
b. 30 days
c. 3 months
d. 6 months

EVALUATION OF DIGOXIN TOXIC PATIENTS PRESENTING TO THE EMERGENCY DEPARTMENT

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Background/Purpose: To evaluate the precipitating factors of digoxin toxicity for patients presenting to an emergency department. Based on those factors a pharmacist will intervene prior to discharge to prevent supra-therapeutic digoxin levels and decrease readmission.

Methods: A retrospective chart review over a 5-year period was conducted. All patients that had a diagnosis of digoxin toxicity were reviewed. A total number of 66 patients had presented to the emergency department with digoxin toxicity. Average digoxin level was 3.3 ng/mL (range 2.3-12 ng/mL) and the average age was 73.3 years old (age range 1 month - 95 years). Serum creatinine levels ranged from 0.6-12 mg/dL. Fifteen of these patients (22%) had a recent discharge from the hospital (less than one week). From the retrospective review, most patients that presented with digoxin toxicity were secondary either to drug interactions, acute renal failure, or chronic renal insufficiency. Two patients (less than one year of age) had accidental overdoses, which were secondary to parents measuring the dose incorrectly.

Intervention: On a daily basis a list of all patients on digoxin will be reviewed by the pharmacy resident. Based on the data collected, all digoxin patients will be analyzed for renal dose adjustment and drug interactions. Physicians will be notified if a change in dose is required or increased monitoring is required. We hypothesize that if a pharmacist monitors patients on digoxin and intervenes prior to discharge, the number of patients readmitted to the ED for digoxin toxicity would decrease. In addition, all parents or caretakers of children to be discharged on digoxin will be counseled.

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

Learning Objectives:

Be able to identify signs and symptoms of digoxin toxicity.

Be able to identify medications that, if given with digoxin, can cause a supratherapeutic digoxin level, and adjust doses accordingly.

Self Assessment Questions:

All of the following are adverse drug reactions related to a supratherapeutic serum digoxin concentration EXCEPT:

a) Arrhythmias
b) Bradycardia
c) Hyperkalemia
d) Visual Disturbances
e) None of the Above

True/False. Since digoxin is not extensively metabolized hepatically, antibiotics do not affect the metabolism of digoxin.

USE OF METFORMIN VERSUS GLYBURIDE FOR TREATMENT OF POST TRANSPLANT DIABETES MELLITUS IN LIVER TRANSPLANT RECIPIENTS

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Post transplant diabetes mellitus (PTDM) is an independent risk factor for cardiovascular complications which may lead to increased morbidity and mortality. Metformin is commonly used to treat diabetes mellitus in non-transplant patients. Presently, no prospective studies exist evaluating the safety and efficacy of metformin in PTDM.

Purpose:
To evaluate the safety and efficacy of metformin in reducing blood glucose compared to glyburide in liver transplant patients with PTDM.

Methods:
Patients enrolled receive metformin (maximum of 2550 mg daily) or glyburide (maximum of 20 mg daily). Dose titration is based on drug tolerance, fasting blood glucose (FBG) levels and self-monitored blood sugar logs. Data collection includes demographics, immunosuppression regimen, rejection rates, hemoglobin A1C, fasting lipid profile, liver profile, FBG levels, insulin use and body mass index (BMI).

Results/Conclusions:
Data based on 11 patients in the metformin arm and 9 in the glyburide arm. The mean age was 50.5 12.3 years and 60.4 7.4 years in the metformin and glyburide arms, respectively. Baseline average BMI was 26.6 for the metformin group and 31.9 for the glyburide group. The majority of patients were on tacrolimus, 81.8% in metformin arm versus 77.8% in glyburide arm. The average baseline insulin use for the metformin group was 173.8 units, at 1 month, 107.7 units, and at 3 months, 55.8 units. Glyburide group average baseline insulin use was 251.3 units, at 1 month, 130.1 units, and at 3 months, 54.4 units. Average hemoglobin A1C values at baseline and Month 3 were 6.4% and 6.0% for the metformin arm and 6.21% and 6.17% for the glyburide arm. At month 3, mean metformin dose was 2044 mg daily and mean glyburide dose was 10 mg daily.

Patient enrollment is still ongoing. Additional data will be presented at the conference.

Learning Objectives:

To evaluate the incidence, etiology and implications of PTDM.

To evaluate safety and efficacy of metformin in liver transplant recipients with PTDM.

Self Assessment Questions:

Approximately what percentage of transplant patients develop PTDM?
a)5%
b)30%
c)55%

True/False: Use of tacrolimus is associated with a higher incidence of PTDM compared to cyclosporine.

HEALTH AND ECONOMIC IMPACT OF A FORMULARY SUBSTITUTION OF ANIDULAFUNGIN IV FOLLOWED BY ORAL FLUCONAZOLE OR VORICONAZOLE, FOR ANIDULAFUNGIN IN PATIENTS WITH CANDIDIASIS OR PRESUMPTIVE CANDIDIASIS

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Background:
Candida spp. are an important cause of morbidity and mortality in hospitalized patients. Treatment of Candida infections has been complicated by an increase in non-albicans Candida species, especially C. glabrata and C. parapsilosis with concerns over resistance to fluconazole. The echinocandin antifungals are a class of broad spectrum intravenous antifungal agents that have been used with increasing frequency in many institutions. These agents are more costly than the azoles, and the comparative clinical and economic impact of echinocandin use is not clearly established.

Purpose:
To evaluate the impact of conversion of IV echinocandin to oral azole therapy on associated hospital costs and patient outcomes.

Methods:
The research design will be a two-phase observational study of patients admitted to Henry Ford Hospital. Phase I is a retrospective baseline period lasting 6 months to establish a historical control cohort. Phase II is a prospective 6 month observation period following implementation of an educational intervention with pharmacy and the division of infectious diseases in which therapeutic recommendations will be made on all patients receiving IV echinocandins, with particular emphasis on duration of IV therapy. During Phase I, data will be collected on patients who received either caspofungin or micafungin according to criteria-based guidelines for the use that require Infectious Disease approval for all echinocandin prescriptions. In Phase II, we will gather information about patients initially receiving IV anidulafungin followed by conversion to an oral azole. Data collected will include demographics, laboratory results, clinical outcomes, and cost of antifungal therapy.

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

Learning Objectives:

Discuss the epidemiology of species causing candidiasis including considerations for antifungal resistance.

Evaluate the clinical and economic impact of conversion from an IV echinocandin to oral azole therapy for treatment of Candida infection.

Self Assessment Questions:

True or False: Candida albicans is the most common species causing candidemia.

True or False: Oral antifungal therapy is contraindicated in the treatment of candidemia.

ANALGESIC STREAMLINING

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Objective: Pain management is an area most hospitals should evaluate and improve. The objective of this project is to improve the use of oral analgesics in the four Milwaukee-area hospitals in Aurora Health Care.

Methodology: The World Health Organization (WHO) pain ladder was used to classify formulary analgesics into steps of the WHO pain ladder. Pre-project data was collected in the orthopedic surgery and medical-surgical patient populations. Collected data included the number of oral analgesics prescribed on an as needed basis, step of the pain ladder each medication was on and the indication for usage if available. The data was used to identify potential order sets to target. Registered nurses from the orthopedic floor of St. Luke's Medical Center were consulted regarding the use of as needed oral analgesics on the unit. Data collected, nursing input, and project goals were used to make changes in the post-operative total joint order set. The project was also introduced to the system-wide interdisciplinary pain management committee. A policy will be established to update physician order sets to include indications for use and to eliminate duplications of analgesics in the same step of the classification ladder. Pharmacists will enact the policy during the routine order set review process.

Results/Conclusions: Pre-project analysis identified the orthopedic surgery patient population as having a larger average number of as needed analgesics in comparison to the medical-surgical patient population (4.5 analgesics versus 2.5 analgesics). Both patient populations had low rates of specific degree of pain indications. The orthopedic surgery population had indications for degree of pain in 5% (17/335) orders versus 14 % (27/198 orders) in the medical-surgical population. Future results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Identify the classification scheme for oral pain medications.

List changes in orders and order sets that were undertaken to improve the use of oral analgesics.

Self Assessment Questions:

True/False: Codeine/acetaminophen and propoxyphene/acetaminophen are classified on the same step of the pain ladder.

True or False: Specific degree of pain indications were added to order sets.

IMPLEMENTATION AND PATIENT SATISFACTION OF TRAVEL MEDICATION CLINICS IN THE COMMUNITY PHARMACY SETTING

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Background: There are few published studies regarding pharmacist-run travel medication clinics, especially in the community pharmacy setting. Travel medications include vaccines and oral medications that may be necessary while traveling internationally. Community pharmacists are very accessible, knowledgeable, and aware of the need for disease prevention. Therefore, Travel Medication Clinics in community pharmacies are a natural evolution in the progression of pharmaceutical care.

Objective: The main purpose of the study is to develop Travel Medication Clinics within community pharmacies to provide information, vaccinations, and medications to people traveling internationally. Secondarily, we want to evaluate patient satisfaction with the services of the Travel Medication Clinics in a community setting. We also want to identify reasons recommended vaccinations/medications are not received by travelers.

Methods: A collaborative practice agreement between a preventative medicine physician's group and the grocery store chain pharmacies in Illinois and Washington has been established. Various pharmacies within the grocery store chain will be asked to be Travel Medication Clinics. The pharmacists will be certified in immunizations and will complete the company's training program along with an APhA CE on establishing Travel Medication Clinics. All patients 11 and older who have been recommended to receive travel medications will be asked to participate in the study. In order to assess patient satisfaction with the service, a two-page questionnaire will be given to the patient at the time of the encounter. Questions will focus on convenience, patient's comfort level with the pharmacist, perceived risk of illness, and the education the patient received regarding staying healthy while traveling. The questionnaire will also gather information regarding patient adherence with receiving recommended vaccinations/medications.

Results: The results will be used to facilitate the implementation of company wide travel clinics and improve upon the current administration process.
Conclusion: NA (research in progress)

Learning Objectives:

Explain the rational for establishing travel medication clinics in community pharmacies.

Identify explanations people offer when choosing whether or not to receive the recommended vaccinations/medications.

Self Assessment Questions:

List several reasons people provide for not receiving all of the recommended vaccinations/medications.

Explain why Travel Medication Clinics in community pharmacies will benefit international travelers.

NURSE SATISFACTION WITH PALLIATIVE CARE CLINICAL PHARMACIST SERVICES

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Purpose: Specialized palliative care pharmacists provide a host of clinical services to the interdisciplinary team involved in the management of hospice patients. To date one study has been conducted assessing the quality of pharmaceutical services provided to hospice programs in Columbus, Ohio. This study was published in 1996, and included 25 nurses from three local hospice programs in Columbus. Services provided by palliative care clinical pharmacists have evolved since the last survey and now encompass many more hospices across the United States. Thus, this survey will include a larger sample size and provide input from hospice nurses across the United States

Methods: A non-randomized online survey of nurses working for hospice programs that contract with Palliative Care Consulting Group, a palliative care clinical pharmacist consulting service. Nursing administrators from the contracted hospices will provide the list of nurses to be surveyed. The final survey will be conducted during February 2007 using the online tool, Zoomerang. Participants will be incentivized to complete the survey. The survey consists of Likert-style, multiple choice, and open-ended questions. All of the data collected will be recorded without patient identification to maintain confidentiality. Questions include nurse demographics, satisfaction with services provided, and perceived value of clinical pharmacist services. Data analysis will be conducted using SPSS statistical software. Prior to distribution of the survey, the project will be approved by an Institutional Review Board.

Results/Conclusion: Preliminary results to be presented at Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Define the role of a palliative care pharmacist in the management of hospice patients.

Review a methodology to assess the satisfaction of clinical pharmacy services.

Self Assessment Questions:

True/False: Medicare mandates that a pharmacist sit on the interdisciplinary team that reviews hospice patients.

List three services that a palliative care pharmacist provides to hospices.

ENOXAPARIN FOR PROPHYLAXIS OF VENOUS THROMBOEMBOLISM IN OBESE PATIENTS

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Purpose

Obesity is ecumenically recognized as an independent risk factor for venous thromboembolism (VTE) for reasons thought to be related to venous stasis and relative immobility. LMWHs are administered at fixed doses for VTE prophylaxis, although for prophylaxis the College of American Pathologists recommends dosing LMWHs to achieve an anti-Xa level of 0.2 to 0.6 IU/ml. Despite concerns of suboptimal dosing of enoxaparin in obese patients for VTE prophylaxis, there is a relative dearth of data assessing and supporting the safety and efficacy of escalating doses, and the limited data available comes from small studies in bariatric surgery patients. The purpose of this study is to evaluate the safety and efficacy of increased doses of enoxaparin for VTE prophylaxis in obese hospitalized patients.

Methods

This was a retrospective review of obese patients who received conventional dosing of enoxaparin 40 mg daily versus those who received the elevated protocol dosing based on an existing hospital protocol. The protocol patients with a body mass index (BMI) = 35-45 kg/m2 received enoxaparin 30 mg bid; BMI = 46-50 kg/m2 received enoxaparin 40 mg bid; and BMI > 50 kg/m2 received enoxaparin 60 mg bid. The primary outcome is the difference in rates of VTE (combined deep vein thrombosis and pulmonary embolism) between protocol and control groups, and the secondary outcome is the difference in rates of major bleeds during the same periods.

Results/Conclusions

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

Learning Objectives:

Describe the concerns of conventional dosing of enoxaparin for VTE prophylaxis in obese patients.

Evaluate recommendations for escalating enoxaparin dosing for VTE prophylaxis in obese patients.

Self Assessment Questions:

True/False. Hospitalized patients with a BMI > 32 kg/m2 are two to three times more likely to have a DVT.

True/False. BMI adjusted-dose enoxaparin may be preferable to fixed doses for VTE prophylaxis, which may produce sub-therapeutic anti-Xa levels

RETROSPECTIVE EVALUATION ON THE APPROPRIATE USE OF ACID SUPPRESSIVE THERAPY (AST) IN HOSPITALIZED PATIENTS AND UPON DISCHARGE

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H2 Receptor Antagonists (H2RA) and Proton Pump Inhibitors (PPI) are both widely prescribed among hospitalized population as well as the general population. Stomach acid is a major mechanism of defense against ingested pathogens and may play a significant role as a barrier to colonization by pathogenic organisms. AST increases stomach pH which can induce hypochlorhydria resulting in colonization by opportunistic pathogens. Evidence suggests that there may be a significant risk of hospital or community acquired gastrointestinal or respiratory infections associated with prolonged or inappropriate AST.

Patients admitted to the hospital are often prescribed AST inappropriately resulting in an increased risk for infectious complications as well as hospital admissions. The purpose of this study is to evaluate the appropriateness of indication and length of treatment among patients prescribed H2RA or PPI upon admission, during hospitalization and at discharge.

A retrospective chart review will be conducted on all patients admitted and discharged from January 2006 to March 2006. Patients will be identified using a computer-generated report and will be evaluated on the proper use of AST. Agents that will be evaluated include hospital formulary H2RA, famotidine and ranitidine and PPI, pantoprazole and esomeprazole. Patients will be followed for a 6-month period after discharge for any documentation of return visits, diagnosis upon readmission, and use of prolonged AST. Appropriateness of therapy will be defined by FDA-approved indications for all four agents as well as indications strongly documented in the literature. The primary outcome will be appropriate indication of H2RA and PPI upon hospital discharge. Secondary outcomes will include readmission to the hospital within 6 months, readmitting diagnosis, AST therapy upon readmission, length of therapy, culture results, and reasons for inappropriate use.

Descriptive statistics will be used to analyze data. Data collection is currently in progress and the summary of preliminary results is pending.

Learning Objectives:

Discuss the incidence of inappropriate prolonged use of AST in hospitalized population

Discuss infectious complications that can arise from prolonged use of AST

Self Assessment Questions:

True/False: The majority of inappropriately prescribed AST is typically due to low risk stress ulcer prophylaxis.

Data have shown that inappropriate use of AST may result in all of the following except:

a. community acquired pneumonia
b. clostridium difficile
c. urinary tract infection
d. hospital acquired gastrointestinal infection

EVALUATION OF THE RELATIONSHIP BETWEEN ANTIDEPRESSANTS AND GASTROINTESTINAL BLEEDING RISK

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Background: In 2001, users of antidepressants in the U.S. totaled 16.6 million. While selective serotonin reuptake inhibitors (SSRIs) and newer antidepressants have been most widely prescribed due to their low adverse reaction profile, recent case reports and studies have suggested a relationship between their use and gastrointestinal bleeding. Further, it has been suggested that antidepressants with high serotonin transporter affinity (versus those with low serotonin transporter affinity) may be associated with a greater risk for potentiating gastrointestinal bleeding. While the majority of studies have sought to identify factors which may increase the risk of gastrointestinal bleeding in patients receiving antidepressants, these studies are limited by their lack of clinical details, failure to consider confounding factors such as gastroprotective drugs, and inconsistent classification of antidepressants between studies.
Purpose: The purpose of this study is to determine if antidepressant therapy increases the risk of developing gastrointestinal bleeding.
Methods: This study is an observational, retrospective chart review of approximately 300 patients from either the IU-Methodist Family Practice Center or the Community Health Network Family Practice Center in Indianapolis who have a documented diagnosis of depression. Patients included in the study were greater than 50 years of age with prescribed antidepressant therapy during January 2002 to December 2005. Each patient's medical record was reviewed to determine patient demographics, co-morbid disease states, prescribed antidepressant(s), concomitant medications, and the occurrence of the primary outcome: hospitalization for treatment of gastrointestinal bleeding. For those who experienced the primary outcome, laboratory data surrounding the time of the bleed were also documented. Among those patients receiving antidepressant therapy, the percentage of patients who experience hospitalization for gastrointestinal bleeding will be compared between those receiving antidepressants with high versus low serotonin transporter affinity.
Results and Conclusions: Results and conclusions are pending based on completion of data collection.

Learning Objectives:

Understand the proposed mechanism of the possible relationship between antidepressants and gastrointestinal bleeding.

Identify which antidepressants have the highest affinity for the serotonin transporter and which concomitant medications have a higher risk of gastrointestinal bleeding.

Self Assessment Questions:

Which of the following statements is true regarding the proposed mechanism between antidepressants and gastrointestinal bleeding:
a.Most circulating serotonin is transported by platelets
b.Serotonin is a platelet activator
c.Serotonin is released by platelets and taken up from the blood by serotonin transporters
d.Levels of platelet serotonin are decreased with treatment of antidepressants with serotonin uptake properties (such as SSRIs)
e.All of the above are true

Which of the following antidepressants have high affinity for the serotonin transporter:
a.Paroxetine
b.Fluoxetine
c.Sertraline
d.Citalopram
e.All of the above

BEHAVIOR, ATTITUDES AND PERCEPTIONS OF PHARMACY FACULTY MEMBERS ABOUT POST-GRADUATE PHARMACY RESIDENCIES

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Purpose: The American College of Clinical Pharmacy (ACCP) issued a position statement asserting that at least 1 year of postgraduate residency training should be a prerequisite by 2020 for pharmacists practicing direct patient care or entering academia. ACCP urges colleges of pharmacy to support it by developing new residency positions and educating pharmacy students about the role of residency training. The goals of this project are to determine if pharmacy faculty members: 1) individually promote residencies, 2) agree that residency training should be a prerequisite for providing direct patient care, and 3) agree residency training should be a requirement for entering academia.
Methods: A current roster was obtained from the American Association of Colleges of Pharmacy (AACP) to develop a database of participants. After field-testing on faculty non-AACP members at The Ohio State University College of Pharmacy, the survey was delivered online via Zoomerang to current members of AACP in January 2007. Faculty were asked to disclose demographic information, personal experience and training, perceived benefits of residency training, thoughts on residency as a prerequisite for direct patient care or academia, if and how they individually promote residencies to pharmacy students, barriers to promotion, and awareness of the topic prior to receiving the survey. Respondents had 1 week to respond with a reminder message sent 3 days after initial distribution. Responses were collected via Zoomerang. Secondary analysis was performed with SPSS.
Results: The survey was sent to 2,414 AACP members; results are pending. Conclusions: Results of this study are expected to determine if and how individual faculty members are promoting residencies and whether they are in agreement with residency training suggestions by ACCP. This information may be used by schools of pharmacy to identify the degree of residency promotion occurring at their school and provide strategies on how to promote residencies.

Learning Objectives:

Discuss the ACCP Position Statement: American College of Clinical Pharmacy's Vision of the Future: Postgraduate Pharmacy Residency Training as a Prerequisite for Direct Patient Care Practice.

Describe reported techniques of current postgraduate residency promotion to pharmacy students.

Self Assessment Questions:

TRUE or FALSE: ACCP recommends that 2 years of postgraduate residency training should be required for a pharmacist to provide direct patient care.

TRUE or FALSE: In order for the recommendations of the ACCP Position Statement to be met, a large number of residencies will need to be developed in the future.

EVALUATION OF THE LENGTH OF STAY WHEN USING ENOXAPARIN VERSUS UNFRACTIONATED HEPARIN FOR THE INPATIENT TREATMENT OF PULMONARY EMBOLISM

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Purpose: Enoxaparin is indicated for inpatient treatment of deep venous thrombosis with or without pulmonary embolism (PE), but the practice for treating PE has not been adopted by all practitioners. Enoxaparin provides practical outpatient management until anticoagulation with warfarin reaches therapeutic levels and has the potential to promote early hospital discharge. National statistics from 2004 reported the median length of stay (LOS) for patients with pulmonary embolism was 5 days. The objective of this study was to evaluate the LOS when using enoxaparin versus unfractionated heparin (UFH) for inpatient treatment of PE. Secondary outcomes include evidence of bleeding, thrombocytopenia, and mortality.

Methods: A retrospective chart review was conducted identifying all patients with a primary ICD-9 diagnosis code for PE from July 2005 to December 2006. All patients = 18 years were included for evaluation. Exclusions from the study included: admission on an intensive care unit; warfarin as a current home medication; active bleeding; contraindications to anticoagulation; allergy to heparin; pregnancy; severe malignant hypertension; severe hepatic failure; patients undergoing dialysis; history of protein C, S, or antithrombin III deficiency; history or development of heparin-associated thrombocytopenia; malignancy; infection; stroke; actual body weight of >150 kg; thrombolytic therapy; and pulmonary embolectomy. Patients were stratified based on the method of anticoagulation initiated upon admission to the hospital as either UFH or enoxaparin.

Preliminary Results: To date 61 patients have been evaluated, 49 patients received enoxaparin and 12 received UFH. The median LOS was 2.5 (1-9) days for enoxaparin and 5 (4-10) days for UFH (p=0.002). There were no episodes of bleeding, thrombocytopenia, or mortality.

Conclusion: Inpatient treatment with enoxaparin for PE will shorten hospital LOS.

Learning Objectives:

Discuss the benefits of using enoxaparin versus unfractionated heparin.

List risk factors for pulmonary embolism.

Self Assessment Questions:

True or False: Clinical trials have demonstrated that enoxaparin is as effective as UFH and is safe to use.

True or False: Low molecular weight heparin has a longer half life than UFH.

ASSESSING THE IMPACT OF A MEDICATION ADHERENCE INTERVENTION IN ADOLESCENT HYPERTENSIVE PATIENTS

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Background: Medication adherence is a common problem among many patients, especially for those with chronic conditions. It is a general issue for all ages, but adolescents have been identified as a potentially problematic group due to the shift of medication-taking responsibility from the parent/caregiver to the patient.

Purpose: The purpose of this study is to determine if a pharmacist-based, individualized educational intervention will have a positive impact on medication adherence in adolescent hypertensive patients.

Methods: Development of this pilot program includes collaboration with the nephrology division. This is a randomized study of hypertensive patients between the ages of 9 and 18 identified through the nephrology division. Identified patients and parents receive a complete explanation of the study and are asked to sign consent upon clinic arrival. An initial assessment is administered to all patients to measure their baseline knowledge of hypertension and the medication(s) they are taking and to identify the barriers to adherence. The randomization is then revealed. Patients are randomized into one of four treatment groups: education and follow-up, education only, follow-up only, no education or follow-up. The pharmacist provides education for those receiving education and develops an individualized plan to improve adherence. Reminder techniques such as pill boxes, text messaging, emails, calendars, and phone calls may be used as adherence tools. Patients are retrospectively monitored on anti-hypertensive medication refill history by a phone call to their pharmacy. The patients randomized to follow-up receive phone calls at 2-, 4-, 6-, and 8-weeks to assess adherence via patient self-report; additional education and pharmacist counseling will also be provided. Patients' medication refill history is reevaluated and a follow-up questionnaire is completed at 8-weeks to assess adherence rates and disease state and medication knowledge. Those patients not receiving education at the initial visit are educated at this visit.

Results: Results are pending further data analysis.

Learning Objectives:

To identify reasons for implementation of a pharmacist-managed medication adherence intervention (in adolescent patients with hypertension)

To assess the impact of pharmacist-led education and follow-up on adherence

Self Assessment Questions:

What were the most common reasons adolescents did not adhere to the medication regimen prescribed by their physician?

Pharmacists do not play a role in providing adequate education to patients. True/False

PHARMACEUTICAL INDUSTRY-AFFILIATED DRUG INFORMATION POSTGRADUATE PROGRAMS

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Background: Currently, prospective residents looking for positions in Pharmaceutical industry-affiliated drug information postgraduate programs (PIADIPPs) face a challenge in finding available information. Many PIADIPPs are not accredited by the American Society of Health-System Pharmacists (ASHP) and hence may not be listed in traditional recruiting resources. Also, program directors of PIADIPPs face the challenge of raising awareness about their programs.

Methodology: Prior to initiating the project, it will be submitted to the Institutional Review Board for approval. Contact information will be gathered to identify the available PIADIPPs. Pharmaceutical company websites will be searched and all personal networking contacts will be pursued. Each program director will be surveyed about goals, affiliations, accreditation, future plans, the structure of the program, duration of the program's existence, jobs graduates tend to take, and methods for recruiting candidates. A second survey will be sent out to obtain general information about PIADIPPs as well. This information will be compiled and listed on an easy-to-access website (e.g., DIA website). The second survey will include more general questions regarding program categorization, accreditation status, program contacts, duration of program, number of positions, location, application deadline, program start date, stipend, pre-requisites, and program special features. The survey results will be analyzed with descriptive statistics using Microsoft Excel software and will be collated and posted in an easy-to-access website or in a professional journal (e.g., DIA Journal, AJHP etc.).

Learning Objectives:

Prospective residents will be able to better compare between Pharmaceutical Industry-Affiliated Drug Information Postgraduate Programs (PIADIPPs) in the future

Residency directors for Pharmaceutical Industry-Affiliated Drug Information Postgraduate Programs (PIADIPPs)will be provided a space (website, article, etc.)to advertise their programs.

Self Assessment Questions:

Will the results of this project save prospective residents' time in looking for Pharmaceutical Industry-Affiliated Drug Information Postgraduate Programs (PIADIPPs)?

Will this project draw the attention of and encourage Pharmaceutical Industry-Affiliated Drug Information Postgraduate Program (PIADIPP)directors in advertising their programs further?

IMPACT OF PHARMACY INTERVENTION ON PNEUMOCOCCAL VACCINATION AND DOCUMENTATION

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The pneumococcal conjugate vaccine is safe and effective in preventing pneumococcal disease in elderly and susceptible individuals. Documentation of assessment and administration is required by this institution's accrediting organization. Documentation and vaccination have improved in this institution since 2003 when a standing order was introduced allowing nurses to perform the assessment and vaccinate.

The purpose of this project was to increase vaccinations and documentation in this hospital through education and daily rounds, and to evaluate the impact of pharmacy intervention.

Education and daily patient rounds comprised the two main components to this project. For education, nursing baseline knowledge of flu and pneumococcal vaccines was assessed with a survey, and an interdisciplinary team of the nurse educator and pharmacy resident educated nursing at staff meetings based on survey results. Individual nurse education was provided on a case-by-case basis. Community education designed to increase outpatient vaccine demand was published in a featured article in the local newspaper. For daily rounds, the pharmacy resident rounded on each patient admitted with a DRG of pneumonia for three months. Effort was made to obtain vaccination status through speaking with the patient, family, physicians, or extended care facilities. For eligible patients, vaccines were provided directly to the nurse for immediate use or could be given by a pharmacist certified in vaccine administration. Prior vaccinations or vaccinations received in the hospital were documented in the chart and computer system which would display the information on subsequent visits. Charts were followed daily and data was collected until interventions were complete or the patient was discharged.

To date, 206 patients were reviewed, showing pharmacy intervention to be effective. Data from 2nd quarter 2006 compared to 4th quarter 2006 show an increase in vaccination documentation (60% to 79%). Data analysis continues, and results will be presented.

Learning Objectives:

Identify indications for revaccination with pneumococcal polysaccharide vaccine when given a list.

List effective interventions to increase vaccination rates.

Self Assessment Questions:

Which patient is eligible for revaccination with pneumococcal polysaccharide vaccine according to the ACIP guidelines?
a. 62 year old male with past medical history of diabetes and hypertension vaccinated more than 5 years ago
b. 78 year old male vaccinated in nursing home 7 years ago
c. 68 year old female with past medical history of diabetes and hypertension who had one shot more than 5 years ago
d. 54 year old female with asplenia vaccinated 2 years ago

True or False: A vaccination cart for hospital employees increases employee vaccination rates.

EFFICACY OF INTENSIVE INSULIN PROTOCOLS IN THE HOSPITALIZED CARDIAC PATIENT

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Literature supports the importance of tight glycemic control in both critical care and cardiac populations. Previous studies have predominately focused on the use of intravenous insulin protocols. However, few studies have demonstrated the use of subcutaneous protocols to maintain euglycemia. New intensive insulin protocols were implemented on three cardiology units in July of 2006 at The University Hospital. It is hypothesized that the use of these newly designed protocols combined with physician and nurse education will show favorable outcomes as compared to previous protocols employed in controlling hyperglycemia. The objective of this study is to compare glycemic control before and after the institution of intensive insulin protocols through evaluation of mean blood glucose.

This is a retrospective, observational study which compares glycemic control after the initiation of intensive insulin protocols. Patients evaluated in the study include those admitted to a cardiology service and assigned a bed on one of the cardiology units. Patients admitted with diagnoses of diabetic ketoacidosis or hyperglycemic hyperosmolar state have been excluded. The primary outcome evaluated is mean blood glucose. Secondary outcomes include median blood glucose, intensive care unit and hospital length of stay, hypoglycemic events, and patients discharged on new anti-diabetic regimens. The study has received approval from the University of Cincinnati Institutional Review Board and results will be presented.

Learning Objectives:

Evaluate the use of protocols in the treatment of inpatient hyperglycemia.

Identify the benefits to euglycemia in the cardiac patient.

Self Assessment Questions:

T / F Improving glycemic control has been shown to decrease hospital and intensive care unit length of stay.

T / F Tight glycemic control has been proven beneficial in all hospitalized patients.

ANTIBIOTIC PROPHYLAXIS IN PATIENTS RECEIVING A VENTRICULAR ASSIST DEVICE

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PURPOSE: Ventricular assist devices (VAD) provide support for patients whose cardiovascular status has become unstable. These devices can provide support until the patient receives a heart transplant from a cadaveric donor or, for patients not suitable for transplant, indefinitely. A major complication of inserting and maintaining a VAD is infection. This complication leads to increased morbidity and mortality in this patient population.
Infection is often associated with the surgical site or the device itself, and many of the infections occur early after the implantation of the VAD. Because of this, appropriate prophylactic antibiotic use is necessary to decrease the number of infectious complications.
Prophylactic antibiotics in this patient population is a difficult issue. The organisms often responsible are vast and varied, and the literature supports regimens that are likewise. The number of prophylactic agents used ranges from one to four, and the duration of prophylaxis ranges from less than 24 hours to 48 hours after removal of all drains and tubes.
Currently at Methodist Hospital of Indiana, two different prophylactic antibiotic regimens are used. This study was undertaken to determine which, if either, of these regimens provided greater benefit in this patient population.
METHODS: A list of all patients who had received a VAD between January 1, 2001 and June 30, 2006 at Methodist Hospital of Indiana was received from the Clarian Heart Failure Clinic. Through a retrospective review of patients' charts and laboratory data, information was gathered regarding these patients. Patients were grouped based on their prophylactic antibiotic regimen. In order to compare the groups, data collected included baseline characteristics, including co-morbidities and antibiotic history among others. Outcome measures of survival, post-surgical infection, presence of multidrug resistant organism, length of stay, readmission, and transplantation were compared.
RESULTS and CONCLUSIONS: To be discussed upon completion of data collection.

Learning Objectives:

State the incidence of acquired infection associated with ventricular assist devices.

List the most common organisms responsible for causing infection in ventricular assist devices patients.

Self Assessment Questions:

Staphyloccocus is responsible for more infections in patients with ventricular assist devices than any other microorganism. T/F

The majority of infections associated with ventricular assist devices occur greater than 90 days after transplantation. T/F

PREVALENCE OF ERECTILE DYSFUNCTION AMONG PATIENTS TAKING ANTIEPILEPTIC MEDICATIONS

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Purpose: Patients taking antiepileptic medications are at risk for developing erectile dysfunction (ED). The effect that antiepileptic drugs (AEDs) have on ED may differ among the antiepileptic drugs (AEDs). The purpose of this study is to determine prevalence of ED in patients taking AEDs, to compare the prevalence of ED in patients taking AEDs and those not taking AEDs, and to determine if patients taking enzyme-inducing AEDs are more likely to develop ED than patients taking enzyme-inhibiting or enzyme-neutral AEDs.

Methods: A retrospective chart review was conducted by gathering patient information from the Computerized Patient Record System from the Lexington Veteran's Affairs Medical Center. The study population consisted of males aged 18-40. Patients with documented ED prior to AED use, patients taking medications other than AEDs that are documented to cause ED, and patients diagnosed with disease states known to cause ED were excluded. From this population, patients with a diagnosis of ED and/or prescribed medications used to treat ED were identified, as well as patients prescribed AEDs. A subset of patients were then identified by cross-referencing the population of patients with a diagnosis of ED with the population of patients prescribed AEDs to determine the patients with both a diagnosis of ED and who were prescribed AEDs prior to the diagnosis of ED. From this data, prevalence of ED in patients taking AEDs was determined. An odds ratio was calculated to determine the odds of developing ED in those taking AEDs compared to those who were not taking AEDs. From the population of patients prescribed AEDs, subsets of patients taking enzyme-inducing, enzyme-inhibiting, or enzyme-neutral AEDs were identified. Odds ratios were calculated for each of these groups to determine the odds of developing ED among different types of AEDs. All data was recorded without patient identifiers and maintained confidentially.

Results: pending
Conclusions: pending

Learning Objectives:

Describe the incidence of erectile dysfunction among patients taking antiepileptic medications.

Compare the incidence of erectile dysfunction among patients taking enzyme-inducing antiepileptics versus patients taking enzyme-inhibiting or enzyme-neutral antiepileptics.

Self Assessment Questions:

Which antiepileptics would be a better choice for those patients experiencing erectile dysfunction?

T or F: The incidence of erectile dysfunction is higher among patient taking enzyme-inducing antiepileptics compared to those taking enzyme-inhibiting antiepileptics.

EVALUATION OF PHARMACISTS' BARRIERS TO THE IMPLEMENTATION OF MEDICATION THERAPY MANAGEMENT SERVICES

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Objective: 1) To assess pharmacists' actual and perceived barriers to the implementation of medication therapy management services (MTMS) in the outpatient setting. 2) To assess what demographic or other factors are associated with the identified barriers.

Methods: A survey with questions regarding barriers encountered in pharmacy practice was developed and pilot tested. The questions covered topics including: documentation, finances, regulatory issues, components of MTMS, interprofessional relationships, patient care, management, and pharmacist concerns. The survey was delivered via an internet-based survey tool in February 2007 to pharmacists in the outpatient setting who are or have interest in providing patient care services. The population includes members of the American College of Clinical Pharmacy (ACCP) Ambulatory Care Practice and Research Network, the American Association of Colleges of Pharmacy (AACP) Pharmacy Practice roster, the American Pharmacists Association (APhA) Community and Ambulatory Practice and Clinical/Pharmacotherapeutic Practice Academy Sections, the American Society of Consultant Pharmacists (ASCP) Senior Care Pharmacist Forum list server, and selected members of American Society of Health-System Pharmacists (ASHP). Pharmacists were sent an email announcement and a link to the survey. Reminders were sent to non-responders after four days, with data collection concluding two weeks after initial distribution. A 5-point Likert scale (strongly disagree to strongly agree) is used to assess the pharmacists' responses. Results will describe demographics, practice site, position, years in practice, and training and certification information. Survey responses will be analyzed with descriptive statistics to identify the most strongly agreed upon barriers and to characterize the population. The survey responses will be analyzed with inferential statistics to assess associations between sample characteristics and the identified barriers.

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

Learning Objectives:

Discuss pharmacists' actual and perceived barriers to implementing medication therapy management services.

Characterize demographic or other factors that are associated with the identified barriers to implementing medication therapy management services in an outpatient setting.

Self Assessment Questions:

TRUE or FALSE: Compensation related concerns were identified as a strongly agreed upon barrier.

TRUE or FALSE: The presence or absence of postgraduate training did not result in significant differences in barriers identified.

DEVELOPMENT OF A PHARMACIST-DRIVEN AMINOGLYCOSIDE MONITORING PROTOCOL

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PURPOSE:
Vancomycin and aminoglycosides are the drugs most commonly monitored and managed by pharmacists in the hospital setting. Currently, pharmacists at the University of Michigan Health System (UMHS) do not have the authorization to make pharmacokinetic adjustments to patients' aminoglycoside regimens without physician approval. We will complete a retrospective data analysis of gentamicin use at the University of Michigan's C.S. Mott Children's Hospital. The data collected will then be used to develop a pharmacist-driven aminoglycoside monitoring protocol at C.S. Mott Children's Hospital.

METHODOLOGY:
This project involves completing a retrospective chart review of patients admitted to the pediatric cardiothoracic intensive care unit or pediatric surgery service from January 1, 2005 to December 31, 2005. The entire sample of patients will be used, allowing us to detect an acceptable appropriateness of greater than 80% and a significant degree of inappropriateness of 20%, with a power greater than 95%. Descriptive statistics will be used to analyze the data from this project and will be utilized as a historical control for a prospective pharmacist-driven gentamicin study. Efficacy endpoints include: mean duration of therapy, mean number of pharmacist interventions per patient, number of appropriate gentamicin concentrations obtained, rate of appropriate physician response to levels, and percentage of pharmacist recommendations followed. Appropriateness of the data collected will be guided by the UMHS policy for gentamicin dosing and monitoring.

RESULTS/CONCLUSIONS:
Currently, limited results have been gathered from the patients admitted to the pediatric cardiothoracic unit. More extensive analysis will be conducted in order to include both patient and antibiotic regimen specific parameters, as well as, to assess patients admitted to the pediatric surgery service. Further results and conclusions will be presented at the conference.

Learning Objectives:

To identify the current trends of aminoglycoside monitoring in the hospital setting.

To describe the current aminoglycoside monitoring system at UMHS and identify the need for a stronger monitoring protocol at this hospital.

Self Assessment Questions:

T/F: The presence of pharmacist-managed aminoglycoside therapy is associated with significant improvements in patient and economic outcomes.

Which of the following drugs are most commonly monitored and managed by pharmacists in the hospital setting?
a.Phenytoin
b.Aminoglycosides
c.Phenobarbital
d.Digoxin

APPROPRIATENESS OF EMPIRIC ANTI-PSEUDOMONAL ANTIBIOTIC USE IN THE EMERGENCY DEPARTMENT

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Multiple studies correlate empirically appropriate antimicrobial therapy with improved patient outcomes. Inappropriate initial therapy has been associated with higher mortality and a greater length of hospital stay when compared to patients on appropriate empiric treatment (approximately 2:1 days). Currently available data justify the need to start the right antibiotics as soon as possible in patients with risk factors for multiple drug resistant (MDR) infections, including Pseudomonas aeruginosa. Based on established risk factors in current literature, most patients at risk for MDR infections should be identified immediately upon presentation and receive anti-pseudomonal antibiotics. However, some patients may inappropriately receive anti-pseudomonal agents despite a lack of compelling indications.

A growing body of evidence suggests an association between the consumption of anti-pseudomonal agents and gram-negative resistance. In addition, unnecessarily broad antibiotic therapy may result in increased rates of adverse effects and superinfection. Thus, it is important to use anti-pseudomonal antibiotics judiciously and limit their use to patients with specific risk factors for MDR infection.

The purpose of this study is to determine the appropriateness of anti-pseudomonal antibiotic utilization in the Emergency Department (ED) at Sinai-Grace Hospital, based on established risk factors for MDR pathogens and Detroit Medical Center (DMC) Criteria.

This retrospective study will utilize pharmacy records to identify patients administered an anti-pseudomonal agent in the ED. Data collection will utilize electronic and paper medical records to identify patient demographics, APACHE II score, Charlson comorbidity index, source of infection, empiric antibiotics, risk factors for MDR organisms, culture results and susceptibilities, mortality, and length of stay. Appropriateness of empiric therapy will be assessed according to DMC criteria and established risk factors for MDR organisms.

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

Learning Objectives:

Identify risk factors for infection with MDR pathogens.

Describe the impact of appropriate empiric antimicrobial therapy.

Self Assessment Questions:

Risk factors for MDR pathogens include all of the following, EXCEPT:
a.Immunosuppression
b.Recent Hospitalization
c.Hypertension
d.End stage renal disease on hemodialysis

True or False. De-escalation is one approach that may be utilized in order to provide empirically appropriate therapy and decrease resistance in the treatment of serious infections.

ANALYSIS OF INDUCTION PROTOCOLS IN HEART TRANSPLANTATION

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Objective: The use of induction therapy in cardiac transplantation reduces early rejection and allows for delayed introduction of calcineurin inhibitors. Although effective, cytolytic agents may be associated with an increased risk of malignancy and a reduction in long-term survival in some patient subgroups. In addition, cytolytic agents are expensive and newer agents, mainly Interleukin-2 (IL-2) receptor antagonists, daclizumab and basiliximab are also used for induction. The main objective of this project is to analyze current induction protocols for heart transplantation at St. Luke's Medical Center, and to determine if changes need to be made based on data from this and other centers, as well as from current literature. Analysis will specifically focus on survival, incidence of infection, rejection and malignancy in heart transplants over the past 5-10 years at this center.

Methodology: Project goals and expectations will be defined after discussion with representatives of the Transplant Cardiology and Immunology Departments. An initial literature review will be completed to help determine endpoints and guide study design. Internal and external transplant databases will then be queried to gather pertinent information. This data will include recipient and donor demographics, administration and total dose of induction, survival rate, rejection rate, infection rate, development of lymphoma, and renal function. Other major cardiac transplant centers will be contacted to determine what induction regimens for cardiac transplant are currently being used nationally. Published and unpublished data looking at IL-2 receptor antagonists will be reviewed, specifically looking at the safety and efficacy of these agents. Results will be compiled, organized, and reviewed with all interested parties. If supported by findings, modification to the existing protocol will be drafted and progress will be monitored.

Results/Conclusions: Data Collection is in progress; results and conclusions will be presented at Great Lakes Residency Conference.

Learning Objectives:

List two classes of agents currently used for induction therapy in heart transplantation.

Describe the potential adverse effects of cytolytic therapy that may occur when used in induction therapy

Self Assessment Questions:

True/False The major benefit of induction therapy is that it reduces early cellular rejection after transplantation.

True/False Interleukin-2 receptor antagonists are associated with a significant adverse effect profile compared with cytolytic agents.

MEDICATION RECONCILIATION: THE CURRENT PROCESS AT UNIVERSITY OF LOUISVILLE HOSPITAL VERSUS THE DEVELOPMENT AND IMPLEMENTATION OF A PHARMACIST DRIVEN PROCESS

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Purpose: The 2006 National Patient Safety Goal to reconcile medications across the continuum of care is enforced by Joint Commission on Accreditation of Healthcare Organizations (JCAHO). There was not a consistent process for medication reconciliation at University of Louisville Hospital (ULH). The purpose of this project was to evaluate the current process at ULH and to implement a uniform process at the time of patient admission.

Methodology: This Institutional Review Board approved study will be completed in four phases. Phase I included a retrospective chart review of 100 patients admitted to ULH to evaluate any discrepancies in the patient home medication lists. Implementation of a uniform medication reconciliation process and the education of ULH staff, followed in Phase II. Phases III and IV will include a prospective review of patients admitted after implementation of the process, comparing discrepancies in the medication histories obtained by pharmacy, nursing, and medical staff.

Results: Four percent of patients had no home medication list, while 31% of patients had more than one. Of the 31% of patients with more than one, discrepancies were noted in 19 (61%) of the patients' medication lists. Immunization histories and medication allergies were documented in 6% and 90% of the patients investigated, respectively. Of the 35 patients with reported medication allergies, 31% had descriptions of allergic reaction provided.

Conclusions: ULH is not consistent with the JCAHO standards in using a standardized home medication reconciliation process and currently allow more than one home medication list to be located in the patient chart. It is anticipated that a Medication Reconciliation Form placed in a designated area in the patient chart will decrease the number of discrepancies that may lead to medication errors. It is expected that medication histories completed by pharmacists will be more accurate than those obtained by other healthcare providers.

Learning Objectives:

Understand the importance of implementing a uniform medication reconciliation process across the continuum of care.

Evaluate the difference between medication histories obtained by pharmacists, as compared to other healthcare providers.

Self Assessment Questions:

Of the patients evaluated, where was the home medication list most commonly found?
a.Emergency Department Notes
b.History and Physical
c.Nursing Notes
d.Progress Notes

List the three critical areas, across the continuum of care, where the implementation of a medication reconciliation process can help optimize patient care.

REFILL AND EDUCATION SERVICE FOR POST-TRANSPLANT PATIENTS

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Objective: Medication regimens for post-transplant patients are complex and require strict management of prescribed therapies. Many patients have difficulty navigating the dosing schedule, side effects, and follow-up for their medications. Various study results suggest including a pharmacist is beneficial for enhancing medication compliance for post-transplant patients. The objective is to coordinate medication refills with education to improve compliance and avoid rejection. Secondary objectives include enhanced pharmacist-patient relationship and improved multidisciplinary collaboration with other healthcare professionals.

Methodology: An evaluation of the current refill process and education provided to transplant patients was completed to identify opportunities for improvement. The cost and benefits of providing medication to transplant patients was determine by reviewing drug costs, reimbursement, and other insurance issues. Community pharmacists will closely follow transplant patients for three months and longer if necessary. Each month, a pharmacist will call the patient to assess compliance and provide education on various topics. Medication refills can be coordinated with clinic visits in an effort to improve compliance and save the patient time. A process for mail delivery will be developed to provide a better way for medication refills for transplant patients living outside the metro area. Pharmacists will provide basic medication consultations via telephone to patients receiving medications in the mail. A patient survey post-implementation may be used to measure patients' satisfaction with the mail delivery service. Prior to commencement, the institutional review board approved this proposal.

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

Learning Objectives:

State the three main educational topics discussed with post-transplant patients.

Identify two financial barriers to mailing immunosuppressants to post-transplant patients.

Self Assessment Questions:

T/F: Medication compliance is one of the most important factors in preventing organ rejection in post-transplant patients.

T/F: The reimbursement rates for most immunosuppressants cover the pharmacy's cost of obtaining the drugs.

IMPLEMENTATION OF PHARMACY SERVICES AT THE ELECTRONIC INTENSIVE CARE UNIT (EICU)

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Purpose: The electronic intensive care unit (eICU) is a secondary patient assessment system that provides 24 hour monitoring of patients by linking a remote facility via computer monitors to the ICU rooms. This monitoring system is already implemented in ICUs across Aurora Health Care. The eICU facility establishes a partnership between the providers at the eICU and the providers at each hospital site to deliver optimal patient care while simultaneously decreasing ICU length of stay and costs. The purpose of this project is to implement pharmacy services at the Aurora eICU. The services will include clinical monitoring for all thirteen Aurora hospitals and after hours pharmacy coverage, including remote order entry, for seven Aurora hospitals.

Methods: After administrative approval for this service, a budget was developed and physical space and equipment needs were identified for the eICU facility. Job descriptions, standards and priorities were written. Early recruitment and hiring was necessary to begin staff training with the different computer programs and pharmacy departments. The clinical pharmacy services that would be provided were identified and procedures were developed to ensure consistency and continuity of pharmaceutical care at all sites throughout the system. The preparation for providing after hours pharmacy services focused on a standardization of protocols and operational procedures throughout the system. A service agreement of the remote pharmacy services was prepared for each hospital. Responsibilities for the after hours pharmacy services continue to be developed.

Results/Conclusions: The implementation started in October 2006 and will continue through the beginning of 2007. The impact of the services will be evaluated in 2007.

Learning Objectives:

Implement pharmacy clinical monitoring and after hours pharmacy coverage services at the Aurora eICU

Assess collected data to evaluate the services.

Self Assessment Questions:

True/False: The electronic intensive care unit (eICU) is a secondary patient assessment system that provides 24 hour monitoring of patients by linking a remote facility via computer monitors to the ICU rooms.

True/False: The inclusion of a clinical pharmacist in the Aurora eICU achieved documented quality improvements and cost reductions throughout the Aurora system.

IMPROVING THE MANAGEMENT OF HIGH-COST CLINIC ADMINISTERED INJECTABLE MEDICATIONS IN AN ACADEMIC MEDICAL CENTER

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Background: The University of Wisconsin Hospital and Clinics (UWHC) provides clinic administered injectable medications for patients with disease states such as macular degeneration, asthma, respiratory syncytial virus (RSV) infection, rheumatoid arthritis, Crohn's disease, bacterial infections, and others. The increasing need to provide such pharmacy services to patients in multiple geographic locations (i.e., clinics) has introduced challenges for providing uniform, efficient, timely and fiscally responsible pharmacy care while obtaining maximum allowable reimbursement for provided services. Objective: The objective of this project is to improve the operational efficiency and revenue cycle management of high cost, non-oncologic clinic administered medications through enhancing and standardizing ordering and distributive processes for these medications throughout the health system. Methods: The current system was analyzed using observation methods, flowcharts, and data analysis to fully review current operational processes. Financial performance, operational efficiency and medication utilization management was assessed via collection and analysis of data related to reimbursement for specified drugs, direct observation of work processes, medication processing and delivery turn-around time, customer perception and drug use evaluations. Once the current system was reviewed and analyzed, identified problems and their associated causes were evaluated by the Clinic Administered Medication Improvement (CAMI) team using cause and effect diagrams and other performance improvement tools. Solutions for improvement were proposed by this team to improve system performance. Results: A business plan for process improvement implementation will be prepared including a return on investment (ROI) analysis describing the benefits of implementing the recommendations.

Learning Objectives:

Identify strategies for recognizing sources for service delays, operational inefficiency, improper revenue cycle management, and inappropriate medication utilization in relation to high-cost clinic administered injectable medications in an academic medical center.

Develop a detailed return on investment (ROI) analysis for implementing dedicated pharmacy personnel for managing high-cost clinic administered medications.

Self Assessment Questions:

What concerns exist with introducing a third party distribution system (i.e., a specialty pharmacy) to the distribution chain of a health-system?

What major areas of cost avoidance can be proposed to effectively justify necessary Full Time Equivalent (FTE) resources for improving the clinic administered medication process in an academic medical center?

CLINICAL EFFICACY AND SAFETY PROFILE OF EZETIMIBE/SIMVASTATIN (VYTORIN) 10/80 MG IN PATIENTS PREVIOUSLY RECEIVING ATORVASTATIN (LIPITOR) 80 MG

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Background: Recent studies have shown that combination therapy of a statin plus a cholesterol absorption inhibitor (ezetimibe) displays greater efficacy in LDL cholesterol (LDL-C) lowering than high dose statin alone. Ezetimibe/simvastatin 10/80 mg resulted in a statistically significant decrease in LDL-C from baseline compared to atorvastatin 80 mg (59% vs. 53%) and greater LDL-C goal achievement. Based upon clinical trials and other VA experiences, the Hines VA Pharmacy and Therapeutics Committee approved patients on atorvastatin 80 mg to be switched to ezetimibe/simvastatin 10/80 mg in April 2006. Therefore, the goal of this research is to verify that the switch from atorvastatin 80 mg to ezetimibe/simvastatin 10/80 mg has resulted in the anticipated benefits of clinical efficacy, preservation of safety and cost savings.

Methods: This study will be a retrospective chart review of patients with hyperlipidemia at Edward Hines Jr. VA Hospital. A list of patients will be obtained from the Pharmacy Service. Patients switched from atorvastatin 80 mg to ezetimibe/simvastatin 10/80 mg with a previously active outpatient prescription for atorvastatin 80 mg during the timeframe from March 5, 2005 through March 5, 2006 will be evaluated for inclusion and exclusion criteria. Outpatient charts will be reviewed using the computerized patient record system (CPRS). Eligible patients will be randomly selected to have their medical record reviewed. Statistical analysis will include a paired t-test for continuous variables and a chi-square test for categorical variables. The sample size calculated for the primary outcome to achieve a 90% power to detect a 5% difference between groups is 90 patients, assuming a standard deviation of 14.5% and a significance level of 0.05 (2-sided).

Results/Conclusions: Results and conclusions of this study will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Identify the three categories of risk that modify LDL cholesterol (LDL-C) goals.

Describe the percent change in LDL cholesterol (LDL-C) that can be expected with combination therapy of a statin plus a cholesterol absorption inhibitor (ezetimibe) compared to high dose statin therapy alone.

Self Assessment Questions:

True or False: Combination therapy of a statin plus a cholesterol absorption inhibitor (ezetimibe) displays less efficacy in LDL cholesterol (LDL-C) lowering than high dose statin alone.

True or False: The 2004 National Cholesterol Education Program Adult Treatment Panel III update states that the recommended LDL-C goal is < 100 mg/dl in high-risk patients, but when risk is very high, an LDL-C goal of < 70 mg/dl is a reasonable therapeutic option.

USE OF APREPITANT FOR PROPHYLAXIS OF POSTOPERATIVE NAUSEA AND VOMITING IN HIGH RISK SURGICAL PATIENTS

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Background

Postoperative nausea and vomiting (PONV) is a common complication of surgery with an incidence up to 80% in high risk patients. Current guidelines recommend triple pharmacologic therapy for prophylaxis in these patients, but therapy failure is still common. Failure of therapy for PONV can have a significant impact on morbidity, as well as cause an increased cost to both the patient and health care institution. Aprepitant is a neurokinin-1 receptor antagonist which has been shown to have both peripheral and central anti-emetic effects, and limited data shows it may be useful for prophylaxis of PONV in high risk patients. Currently, aprepitant has an approved status on The OSUMC Formulary of Accepted Medications for use in the control of chemotherapy and radiation induced nausea and vomiting, but not for PONV.

Methodology

This is an ongoing two phase evaluation which will be submitted to the IRB for approval prior to commencement. The first phase consists of a retrospective medication use evaluation to evaluate and characterize the non-formulary use of aprepitant for PONV. In addition, a case-match evaluation of the incidence of breakthrough PONV with this therapy as compared to patients who did not receive aprepitant will also be conducted. The second phase will be a cost/benefit analysis to determine if the addition of aprepitant 40 mg to the formulary for PONV prevention would be a fiscally responsible decision.

Results and Conclusion

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

Learning Objectives:

Identify the risk factors associated with increased incidence of PONV

Evaluate and determine proper prophylactic therapy for PONV

Self Assessment Questions:

The following are risk factors for PONV except:

A. Female Sex
B. Positive smoking history
C. History of motion sickness
D. Procedure lasting longer than 60 minutes
E. All of the above are associated with increased risk for PONV

True or False: A triple therapy of dexamethasone 4 mg, ondansetron 4mg, and metoclopramide 10 mg consists of an appropriate prophylaxis of PONV in an extremely high risk patient.

DURATION OF ANTIBIOTIC PROPHYLAXIS AND CLINICAL OUTCOME IN PATIENTS FOLLOWING MAJOR ORTHOPEDIC TRAUMA

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PURPOSE: The benefit of prophylactic antimicrobial agents in patients following major orthopedic trauma has been widely noted, but the duration for prophylaxis remains controversial. Guidelines from the Eastern Association for the Surgery of Trauma (EAST) have recommended a duration of antibiotic prophylaxis for open grade III fractures lasting 72 hours after the time of injury or not more than 24 hours after soft tissue coverage of the wound is achieved, whichever occurs first. The purpose of this study was to evaluate compliance with the EAST guidelines, to compare infection rates when EAST guidelines were followed and to compare antibiotic-related complication rates.

METHODS: Consecutive patients > 18 years of age who had major orthopedic trauma were retrospectively identified using the institutional trauma registry from January 2000 to December 2006. Patients were included if they had documentation of a grade III open fracture. Patients were excluded from the study if they were pregnant, transferred from another institution or died within 7 days of injury.

RESULTS: To date 14 patients have been evaluated. Demographics were similar between groups. Compliance with EAST guidelines was noted in 21% (3/14) of patients. The duration of antibiotic prophylaxis in the EAST group was 1.3±0.5 days compared to 5.5±2.5 days in the non-EAST group ($p = 0.017$). There was no difference in infection rates between the EAST group and non-EAST group [0% (0/3) and 36% (4/11), $p = 0.5$]. There were no antibiotic related complications reported in either group.

CONCLUSIONS: Based on preliminary data, compliance with the EAST guidelines is poor. Antibiotic duration that exceeds recommendations from EAST will not lower infection rates. Longer durations of antibiotics prophylaxis following major orthopedic trauma should be discouraged.

Learning Objectives:

Identify the optimal duration of antibiotic prophylaxis in patients with open fractures.

Evaluate complications that could result from a prolonged duration of antibiotic prophylaxis following major orthopedic trauma.

Self Assessment Questions:

For grade III open fracture, antibiotics should be continued for only 72 hours after the time of injury or not more than 24 hours after soft tissue coverage of the wound is achieved, whichever occurs first. T/F

Inappropriate use of antibiotics has been associated with various consequences including antimicrobial resistance, C. difficile colitis, increase costs and adverse drug events. T/F

EVALUATION OF THE IMPACT OF A RISK ASSESSMENT TOOL FOR VENOUS THROMBOLIC EVENT PROPHYLAXIS IN A COMMUNITY TEACHING HOSPITAL

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Purpose: Venous thrombolic events (VTE) have been documented to account for more than 250,000 hospitalizations per year in the United States. Studies at Duke University have shown that up to 42% of the patients at risk for deep vein thrombosis did not receive prophylactic therapy. The objective of this study is to determine if a risk assessment tool for VTE in hospitalized patients would impact the number of patients receiving appropriate prophylaxis therapy for VTE prevention.

Methods: This study has been approved by Institutional Review Board. The hospital medical records system will be used to retrospectively review patients for the control group. Patients meeting the criteria will be evaluated during a one month time period to determine if they received appropriate VTE prophylaxis. Following the initial evaluation, a risk assessment tool has been developed using guidelines from the American College of Chest Physicians. The risk assessment tool will then be implemented along with education of the medical staff, nursing and pharmacy staff regarding VTE prophylaxis. The following data will be collected; age, weight, gender, family history of deep vein thrombosis, risk factors for VTE, scheduled surgeries or procedures, and pertinent medical history. The type of VTE prophylaxis used along with any signs or symptoms of an occurrence of a symptomatic deep vein thrombosis (DVT) or pulmonary embolism (PE) during the patient's hospitalization as well as readmission for symptomatic DVT or PE 30 days after admission will be noted. The 2004 Chest guidelines will be used to assess appropriate VTE prophylaxis. All data will be recorded without patient identifiers to maintain confidentiality. The appropriateness of VTE prophylaxis will then be evaluated and recorded at baseline and after the implementation of a VTE risk assessment tool.

Results/Conclusions: Data collection and conclusion is currently underway

Learning Objectives:

To describe appropriate therapies that can be used to prevent VTE.

To describe risk factors for VTE.

Self Assessment Questions:

Low Molecular Weight Heparins are most commonly used agent for VTE prophylaxis. True or False

VTE poses a significant risk in medical patients. True / False

EFFECTS OF RABBIT ANTITHYMOCYTE GLOBULIN INDUCTION IN ADULT LIVING-UNRELATED KIDNEY TRANSPLANT RECIPIENTS

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PURPOSE

Recent data have shown that living donor renal transplants, specifically living-unrelated renal transplants (LURT), are at higher risk for acute rejection than deceased donor transplants. In January 2005, the University of Michigan Transplant Center implemented a rabbit antithymocyte globulin (rATG) induction protocol for all LURT (Thymoglobulin 1.5 mg/kg IV daily for 5 days, adjusted for leucopenia). In response to the lack of data regarding rATG in LURT, we compared the rate of acute rejection in LURT in patients who received rATG and those that did not.

METHODS

The retrospective, historical control study was approved by the IRB. Our control group consisted of 41 LURT who received no induction therapy at the time of transplant. We compared them to 36 patients who received rATG. Inclusion criteria included LURT between January 2003 and December 2005, age > 18 years, and users of a calcineurin inhibitor, mycophenolate mofetil and corticosteroids as maintenance immunosuppression per our center's protocol. Exclusion criteria included patients who have received previous transplant, those of African-American ethnicity, and those with panel reactive antibody (PRA) > 30%. The primary outcome was biopsy-proven acute rejection at one year post-transplant. Secondary outcomes included severity of rejection, graft failure, death, and the incidence of malignancy and cytomegalovirus (CMV) disease.

RESULTS/CONLUSIONS

The two groups were comparable regarding age and gender of recipient/donor, PRA, etiology of end stage renal disease, and CMV serostatus. The incidence of biopsy-proven acute rejection at one year post-transplant in the rATG group was 2.8% vs. 48.8% in the control group ($P < 0.001$). Graft failure, death, and incidences of CMV disease and malignancy were not significantly different. The control group also had more severe rejection than the rATG group. Our findings suggest that rATG induction therapy may be effective and safe for LURT.

Learning Objectives:

Describe the rationale for using rATG as induction therapy for LURT.

Identify potential toxicities and common concerns with rATG administration.

Self Assessment Questions:

TRUE/FALSE: LURT recipients have a lower risk of acute rejection than living-related transplant recipients.

TRUE/FALSE: Based on retrospective data, rATG appears to be a safe and effective option for induction therapy in patients undergoing LURT.

COMPARISON OF GLOMERULAR FILTRATION RATE (GFR) BY THREE METHODS IN PEDIATRIC ONCOLOGY PATIENTS

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Background: GFR is a measurement of the kidney's ability to excrete waste products such as urea and creatinine as well as drugs and/or metabolites. When GFR substantially declines, renally-eliminated medications may require dose adjustment. Knowing the functional capacity for renal excretion may guide treatment plan modifications for nephrotoxic chemotherapy. Studies have shown that serum creatinine can grossly overestimate GFR in both adults (Cockcroft-Gault equation) and pediatrics (Schwartz equation). Other methods have been used which more accurately determine GFR, however use in pediatrics may be limited.

Objectives:

Primary objectives are to compare

1. GFR measured by technetium 99 diethylenetriamine pentaacetate (Tc99-DTPA) with GFR calculated using serum creatinine and the Schwartz equation
2. GFR estimated by calculating aminoglycoside renal clearance with GFR calculated using serum creatinine and the Schwartz equation

The secondary objective is to compare GFR measured by Tc99-DTPA with GFR estimated by calculating aminoglycoside renal clearance.

Methods: Retrospective chart review of pediatric oncology patients receiving Tc99-DTPA renal scan and serum aminoglycoside concentration measurements from 2000 to 2006 were identified using billing codes for these procedures. Patients admitted to the PICU with septic shock or multi-organ failure, and/or receiving vasopressors, and/or have a calculated aminoglycoside volume of distribution varying by 50% of the population range during GFR estimation will be excluded. Demographics (age, gender, race, diagnosis, weight, height, nutritional status) and outcomes data (serum creatinine, Tc99-DTPA GFR, aminoglycoside clearance) will be collected. Serum creatinine values measured concurrently (2 days) during the Tc99-DTPA scan and at time of measurement of serum aminoglycoside concentrations will be used to calculate the Schwartz-based clearance. Statistical comparisons will be presented with Bland-Altman plots.

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

Learning Objectives:

Determine if serum creatinine is an accurate marker of GFR in pediatric oncology patients.

Identify the limitations to each method to determine GFR.

Self Assessment Questions:

True/False. Patients receiving nephrotoxic chemotherapy should have a GFR measurement prior to initiation of chemotherapy.

The simplest and most widely used formula to determine renal clearance using serum creatinine in pediatric patients is:
a)Cockcroft-Gault
b)Calvert
c)MDRD
d)Schwartz

EVALUATING THE ACCURACY OF DIAGNOSING HEPARIN-INDUCED THROMBOCYTOPENIA IN A UNIVERSITY HOSPITAL

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Background/Objectives:
Currently, diagnosis of heparin-induced thrombocytopenia (HIT) is subject to inaccuracy based on the clinicopathologic nature of diagnosis. Reliance on the enzyme-linked immunosorbent assay (ELISA) is subject to overdiagnosis of HIT due to its lack of specificity. Potential therapeutic implications are significant as patients may be inappropriately deemed heparin allergic leading to an overuse of costly alternative agents of heparin such as direct thrombin inhibitors (DTIs). The objective of this study is to determine the accuracy of the diagnosis of HIT by using the 4 Ts diagnostic tool in conjunction with evaluating the results of the HIT ELISA and the serotonin-release assay (SRA).

Methods:
All adult patients (age > 17 years) who have received one of the alternative agents (argatroban, lepirudin, bivalirudin) used in patients diagnosed with HIT over a 1-year period ending August, 2006 will be included in the study. Demographic data will be collected including service, age, sex, and weight. Also, the presence of a Hematology Consult will be noted. Other data to be collected includes initiation and duration of anticoagulation treatment, platelet counts, and SRA and ELISA test results. A determination of the method of HIT diagnosis will be made for all patients. A probability score for the presence of HIT will be determined using the 4T method. Patients will be classified as to the probability of having HIT based on laboratory results and use of the 4T method.

Results:
Data collection is in progress.

Learning Objectives:

Describe the pathogenesis of HIT.

Describe methods of diagnosing HIT.

Self Assessment Questions:

Which of the following is true in regards to HIT?
a.Occurs more frequently in patients receiving low-molecular weight heparin (LMWH) versus unfractionated heparin (UFH).
b.Is non-immune mediated and platelet counts rarely fall below 100,000.
c.Has thrombosis as a potential clinical sign.
d.Cannot be confirmed with using SRA alone.

T / F: The HIT ELISA has a high specificity but low sensitivity, making it unreliable to confirm HIT.

IMPLEMENTATION OF A COMPUTERIZED ORDER SET FOR THE SEPSIS BUNDLE: A QUALITY IMPROVEMENT INITIATIVE IN THE MEDICAL INTENSIVE CARE UNIT AT THE CINCINNATI VAMC

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Background: The surviving sepsis campaign (SSC) guidelines for the management of severe sepsis and septic shock were created to increase awareness among clinicians and decrease the high mortality rate associated with severe sepsis and septic shock. The guidelines include novel, evidence based interventions that have proven effectiveness in reducing mortality rates of severe sepsis and septic shock.

Purpose: The purpose of this study compare the compliance rates with the SSC guidelines before and after the implementation of a computerized order set for the sepsis bundle based on the SSC guidelines.

Methodology: This will be a retrospective chart review conducted in the MICU at the Cincinnati VAMC. A computerized order set for the sepsis bundle will be created and implemented. Patients admitted to MICU with severe sepsis or septic shock diagnoses will be identified using the VA computerized patient record system (CPRS). Identified patients will be included in the study if they meet the diagnostic criteria for severe sepsis and are admitted to the MICU during the study period beginning from January 1, 2006 to March 31, 2007. Selected patients will be separated into two groups. The pre implementation group which will consist of 35 consecutive patients admitted prior to the implementation of the computerized order set. The post implementation group will consist of 35 consecutive patients admitted following the implementation of the order set. The primary end point is the compliance rate with the SSC guidelines between the two patient groups. The pre implementation group will be compared to the post implementation group to measure the impact of the implementation of the order set on compliance with the SSC guidelines. Patient care will be considered compliant if the timing and treatment interventions are consistent with the SSC guidelines. Results will be presented at the 2007 Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Describe the progression from sepsis to septic shock.

Discuss the timing and role of each intervention used in the management of sepsis syndrome.

Self Assessment Questions:

True or False: The first intervention for patients presenting with severe sepsis is vasopressor administration.

True or False: Tight glycemic control is achieved when the blood glucose is maintained at less than 250 mg/dL.

EDUCATING PHARMACISTS TO PROVIDE PALLIATIVE CARE

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Background: Our institution recently celebrated the opening of an inpatient acute palliative care unit. The recognition of the unique needs of this patient population and the inpatient staff pharmacists' lack of familiarity with these needs prompted the development of an educational program. Therapeutic issues such as alternative routes of drug administration, dosing regimens, monitoring policies, and off label medication uses have been the focus. Considering the lack of formal treatment guidelines and randomized, controlled clinical trials, many inpatient pharmacists could be uncomfortable with medication orders or drug information questions from the palliative care team. Current hospital policies and guidelines for the administration of many medications did not apply to this specialized patient population and needed to be revised or developed, and communicated to the pharmacy staff.

Objectives: To 1) identify therapeutic and pharmacy issues related to the needs of palliative care patients 2) participate in the writing or revision of hospital policies regarding medication administration 3) educate the pharmacists involved in the care of these patients on the concepts of palliative care, available treatments, and the hospital policies regarding the administration of these medications.

Methods: A survey was conducted assessing palliative care issues, disease states encountered, symptoms involved, medications used, and familiarity with the reference materials available. The pharmacists then attended mandatory educational programs focusing on the needs uncovered by the survey results. Additional communications included written and electronic notifications and the compiling of key articles and references. Following the educational series, the survey will again be conducted, and the pharmacists' familiarity and comfort level with palliative care issues will be re-assessed. The Wilcoxon signed rank test will be applied to the pre and post survey results.

Results and Conclusions: Results to be presented at the Great Lakes Pharmacy Residency Conference in April 2007.

Learning Objectives:

Identify pharmacy related issues which may be different in the palliative care population as compared to those anticipated in the general inpatient population.

Determine the effect educational sessions have on the inpatient pharmacists' understanding of palliative care issues.

Self Assessment Questions:

True or False: There are evidenced-based guidelines regarding the medication regimens used in palliative care.

True or False: Inpatient pharmacists would generally be comfortable processing an order for a continuous infusion of midazolam for a non-ventilated, non-monitored patient.

EVALUATION OF TWO MODELS OF ANTICOAGULATION CARE DELIVERY

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Background: Several years ago, the Madison VA Anticoagulation Management Service (AMS) studied the use of a questionnaire, called an Interim Telephone (IT) form, which was completed by the patient on the day of INR testing to facilitate clinical decisions with telephone contacts. The IT form included the usual questions the Anticoagulation Clinic provider would have asked during a traditional clinic visit. The study concluded the use of the questionnaire did not negatively affect anticoagulation control. Unfortunately, this study did not address whether the implemented changes improved efficiency. Our study introduces the clinical support function of a modified Interim Telephone (mIT) form with traditional face-to-face visits to determine whether its use improves clinic efficiency.

Method: Prospective, non-blinded, cohort study evaluating two models of anticoagulation care delivery with approximately 300 subjects from the VA AMS serving as their own control. The study will include an initial screen/consent visit and a follow-up face-to-face visit facilitated by the use of the mIT form. Patients will be educated on the use of the mIT form and asked to complete the form during their follow-up visit. Face-to-face visit with the mIT form will be timed and compared to the patient's baseline clinic visit time on file from previous QA activities. Baseline data related to factors that may affect the patient's encounter times will also be collected. The primary objective is to determine the difference between the baseline time-in-motion measurement for a traditional face-to-face visit and the measurement for face-to-face visits facilitated by use of the mIT form. Relationships between anticoagulation-related factors and patient co-morbidities and the clinic visit times will be assessed.

Purpose: To compare the efficiency of two models of anticoagulation care delivery: traditional face-to-face versus face-to-face visits facilitated by a modified Interim Telephone (mIT) form.

Result: Pending
Conclusions: Pending

Learning Objectives:

Describe the role of a modified IT form during an anticoagulation clinic visit.

Determine some of the factors that may affect clinic visit times

Self Assessment Questions:

Several studies have demonstrated comparable safety and effectiveness of using telephone follow-up for Anticoagulation Clinics compared with face-to-face clinic visits. T/F

Benefits of improved efficiency in an anticoagulation clinic include:
a.Reduced patient waiting times
b.Ability for the clinicians to maximize therapeutic encounters
c.Opportunity to provide care to a greater number of patients
d.All of the above

COLLABORATION BETWEEN LOCAL HEALTH SYSTEMS AND A COMMUNITY PHARMACY TO IMPROVE ASTHMA OUTCOMES

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PURPOSE: Current asthma guidelines from the National Asthma Education and Prevention Program (NAEPP) have had little impact on improving asthma treatment since they were originally published in 1991. Inappropriate medication usage, incorrect device technique, and poor patient understanding remain major barriers to optimizing asthma care. Pharmacist-directed asthma management studies have demonstrated greatly improved disease outcomes. The purpose of this pilot study is to improve treatment adherence and outcomes in a cohort of patients with asthma through implementation of a disease management program in a community pharmacy in collaboration with local health systems.

METHODS: Primary outcomes and target population needs were defined through discussions with a local medical group and managed care organization. Following approval from an investigational review board, thirty patients aged 12 and greater were identified by the medical group and regional pharmacy chain hosting the intervention. Study participation required evidence of excessive short-acting 2-agonist use. After obtaining patient consent, physicians were asked for specific information including their patient's asthma severity classification, action plan, and spirometry results using a standardized data collection form. Over a 6-month period, patients had the opportunity to schedule several flexible visits with a community pharmacist. Three structured sessions focused on increasing patient understanding, developing an action plan, and identifying symptom triggers were the primary components of the intervention. Each visit also included a medication review, adherence assessment, and device demonstration. All patient data was documented on a flow sheet and maintained in a paper chart. A summary of the intervention and any recommendations were communicated with the patient's physician. Primary outcomes included changes in frequency of albuterol use and adherence to controller medications. Secondary outcomes included changes in direct asthma-related medical costs and frequency of medical visits.

RESULTS: Data collection is in progress.

Learning Objectives:

Describe the barriers associated with appropriate asthma treatment.

Evaluate the role of disease state management programs in community pharmacy.

Self Assessment Questions:

Mortality due to asthma has decreased over the past two decades. T/F

Which of the following is/are considered important goals of asthma therapy?
a.Obtaining near-normal pulmonary function
b.Providing optimal pharmacotherapy with the fewest adverse effects
c.Maintaining a normal level of physical activity
d.Meeting patients' expectations of asthma care
e.All of the above

PROCESS IMPROVEMENT STRATEGIES POST-IMPLEMENTATION OF BARCODE MEDICATION SCANNING IN THE HOSPITAL SETTING

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PURPOSE
Medication errors have headlined many recent news broadcasts across the nation. These headlines have forced hospitals to look at their current medication distribution and administration processes to improve patient safety. The implementation of barcode medication scanning at the point of patient care can reduce the incidence of medication errors. However, implementation and use is complex. This analysis will examine the current barcode medication scanning process at Parkview Health as well as identify potential problems associated with this process. This analysis will also examine the development and implementation of solutions to these identified problems.

METHODS
Parkview Health has formed a Barcode Medication Scanning (BCMS) taskforce consisting of administrative, pharmacy, nursing, safety/quality and information systems personnel. This committee was formed to increase barcode scanning compliance for all patient specific medications and wristbands. The pharmacy department has taken an active role in reducing the incidence of potential medication errors. Processes were implemented to increase the number of bar-coded medications and also to visually inspect these barcodes for any obvious defects likely to result in scan failure. Educational flyers were developed illustrating the proper scanning method for certain problematic medications. Hardware was modified for improved label printing. A kiosk was developed to scan and verify each medication as it is received into the pharmacy.

RESULTS
Data collection is ongoing. The overall scanning rate compliance has improved from 78% to 95% thus far. Final results will be presented.

CONCLUSIONS
Implementation of strategies identified and developed by the BCMS taskforce have improved the overall scanning compliance of medications throughout the health system and have therefore improved patient care and safety.

Learning Objectives:

Identify root causes of problems associated with barcode medication scanning.

Design and implement an action plan to address barriers to barcode scanning.

Self Assessment Questions:

True or False: BCMS is aimed at reducing medication errors while ensuring the five rights of drug administration.

True or False: Improving the compliance rate of barcode medication scanning is solely the responsibility of the pharmacy department.

DEVELOPMENT AND IMPLEMENTATION OF A NEW DISCHARGE MEDICATION RECONCILIATION PROCESS AT AN ACADEMIC MEDICAL CENTER

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Purpose:
Froedtert Hospital is a 426-bed academic medical center located in Milwaukee, Wisconsin. In 2005, pharmacists began conducting medications interviews on all inpatients and reconciling admission orders. With institutional procedures for admission medication reconciliation in place, the focus shifted to discharge medication reconciliation. The current process for discharge medication orders relies upon multiple transcription steps, increasing the chance for errors. The purpose of this project is to develop and implement a streamlined process for discharge medication reconciliation.

Methods:
The accuracy of the current discharge process was assessed by auditing one surgical and one medicine patient care unit for discharge prescribing errors. Information collected included errors in physician discharge orders and nursing discharge summaries. A new discharge medication form was created. This form captures patients' home and inpatient medications and is used to order medications upon discharge. A pilot using the new medication reconciliation discharge report is ongoing on one surgical unit, and will be expanded to a medicine unit. Workflow changes associated with using the form were addressed by a multidisciplinary discharge throughput committee.

Results:
Sixty-six patient discharges with 345 discharge orders from a surgical unit were analyzed. Common errors by physicians included omission of home and inpatient medications, and missing route, strength or directions. For nurses writing the medication list for patients, common errors included use of inappropriate and unapproved medical abbreviations, as well as transcription errors.

Conclusions:
Initial assessment of discharge medication errors demonstrated the need for a standardized method to order medications at the time of hospital discharge. The computer-generated medication discharge form provides physicians with complete, accurate medication information and eliminates a key transcription step in the discharge process. It is anticipated that this improved process will provide patients more comprehensive medication instructions upon discharge and decrease errors.

Learning Objectives:

To learn about the challenges associated with implementing a medication discharge reconciliation process.

To learn how to develop and effectively implement a discharge medication reconciliation process in an academic medical center.

Self Assessment Questions:

How effectively did baseline data of errors and omissions from the discharge process helped to launch a revised workflow?

How effective was education and planning in the successful implementation of the discharge medication reconciliation report form?

MEDICATIONS AT TRANSITIONS AND CLINICAL HANDOFFS (MATCH) INITIATIVE: THE VALUE OF MEDICATION RECONCILIATION IN THE MANAGEMENT OF PATIENTS' MEDICATIONS AT DISCHARGE

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Background: Medication reconciliation is defined by the Joint Commission on Accreditation of Healthcare Organizations as the process to "Accurately and completely reconcile medications across the continuum of care," which has been recognized as a medication error reduction strategy. The implementation and hope that medication reconciliation would provide additional safety for patients demonstrated importance by highlighting that medication errors do occur at admission and discharge. The purpose of this study was to identify where medication discrepancies at discharge originated during a patient's hospital course.

Methods: A retrospective study conducted at Northwestern Memorial Hospital (Chicago, IL) determined medication discrepancies upon discharge from a sample of general medicine patients from July through November 2006. Patients were selected from the MATCH database, which contains admission medication histories taken by research pharmacists. Current orders at discharge, discharge instructions, and the MATCH researcher medication list upon admission were reviewed to identify unintended discrepancies.

Results: 116 patients were reviewed. The mean number of unintended discrepancies upon discharge was 1.5 (171/116) per patient. Of the 171 discrepancies identified, the top three discrepancies were: omission 56% (96/171), different frequency 27% (47/171), and different dose 14% (24/171). The top two most common drug class discrepancies were cardiovascular agents (18%) and gastrointestinal agents (14%). The top 8 medication classes represented 70% (119/171) of the discrepancies.

Conclusion: Unintended discrepancies between medications on admission, during the inpatient stay, and at discharge are common and have the potential to cause significant patient harm. To ensure patient safety at discharge, it is imperative to consider both a patient's home medications and current inpatient orders before determining a discharge medication regimen.

Learning Objectives:

1.Understand the importance of Medication Reconciliation when a patient is discharged from the hospital.

2.To define the role pharmacists can play in the Medication Reconciliation process.

Self Assessment Questions:

1.By failing to reconcile a patient's medications at discharge all of the following may occur:
a. unnecessary medication
b. duplicate medication
c. omitted medication
d. incorrect route/dose
e. all of the above

2.The absence of verifying the accuracy of a patient's medication list upon admission and performing Medication Reconciliation can have a significant impact on a patient's medications at discharge. T/F

INPATIENT MANAGEMENT OF SUPRATHERAPEUTIC INTERNATIONAL NORMALIZED RATIOS: AN ASSESSMENT OF ADHERENCE TO THE 2004 AMERICAN COLLEGE OF CHEST PHYSICIAN GUIDELINES

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Background: Supratherapeutic international normalized ratios (INRs) are a common clinical problem in patients taking warfarin because of their association with an increased risk of bleeding. Evidence based guidelines for the management of elevated INRs and/or bleeding in patients receiving warfarin were most recently published by the American College of Chest Physicians (ACCP) in 2004. These guidelines outline an approach to and recommendations for balancing the risks of hemorrhage with the risks of thrombosis, however variability exists in clinical practice. It is anticipated that adherence to the guidelines will be suboptimal in defined subgroups of patients, which may guide future educational, clinical, or process interventions.

Purpose: To assess adherence to the ACCP guidelines for the management of elevated INRs in patients taking warfarin.

Methods: The study is a retrospective chart review of inpatients receiving warfarin with an INR greater than three. A random sample of 100 patients presenting from January through November 2006 was included. Patient data was categorized according to INR and the presence or absence of bleeding. Adherence to the ACCP guidelines was assessed by comparing any changes in warfarin therapy, or the dose and route of vitamin K administered in response to the INR elevations to the course of action recommended by the guidelines. Secondary outcomes include the time to return to therapeutic INR, and length of stay.

Results/Conclusions: Data collection is in progress. Results and conclusions will be presented at the conference.

Learning Objectives:

To describe the ACCP guidelines for management of supratherapeutic INRs including the recommended dose and route of Vitamin K.

To identify potential areas of or trends in non-adherence to the guidelines.

Self Assessment Questions:

True/False. Overcorrection of an elevated INR increases the risk for thrombosis.

True/False. Vitamin K given PO, IV, IM, or SC is equally safe and effective.

EVALUATION OF GLUCOSE CONTROL USING A BASAL, BOLUS AND CORRECTION INSULIN REGIMEN COMPARED TO A SLIDING-SCALE INSULIN REGIMEN

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PURPOSE:

Hyperglycemia in hospitalized patients is associated with increased morbidity, mortality, and healthcare costs. The American Diabetes Association guidelines recommend maintaining fasting blood glucose (BG) between 90-130 mg/dl and postprandial glucose <180 mg/dl for non-ICU patients.

Sliding-scale insulin (SSI) regimens are used to manage hyperglycemia in hospitalized patients. SSI regimens usually feature non-scheduled regular or rapid-acting insulin administered in response to BG elevations. This "reactive" approach tolerates a wide range of BG concentrations and leaves the patient at risk for both hypoglycemia and hyperglycemia.

Carbohydrate counting is a glycemic management tool featuring regular or rapid-acting (bolus) insulin for meal coverage along with scheduled long-acting (basal) insulin. A patient-specific insulin-to-carbohydrate ratio (i.e., 1 unit insulin:15 grams carbohydrates) is used to calculate the amount of insulin required for each meal. If the patient's pre-meal BG is elevated, an additional correction dose of rapid-acting insulin is added to the mealtime coverage.

The objective of this project is to evaluate glycemic control using a basal, bolus, and correction (BBC) insulin regimen (featuring carbohydrate counting) compared to traditional SSI.

METHODS:

Our institution is currently piloting a BBC insulin regimen (featuring carbohydrate counting). Data will be collected from 25 SSI patients and 25 pilot patients. Data collection parameters include: patient age, gender, body mass index, concomitant corticosteroid use, outpatient anti-diabetic medications, inpatient anti-diabetic medications and doses received, inpatient blood glucose readings, episodes of hypo/hyperglycemia, and treatment received for hypoglycemia. Patients on BBC insulin will be compared to patients who received SSI during the data collection period.

RESULTS AND CONCLUSIONS:

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

Learning Objectives:

Describe the complications associated with uncontrolled hyperglycemia in the hospital.

Describe the differences between traditional SSI and a basal, bolus, correction insulin method for controlling blood glucose.

Self Assessment Questions:

Which of the following can occur in a diabetic patient with poor blood glucose control?

a. Microvascular complications
b. Macrovascular complications
c. Increased mortality
d. Higher healthcare costs
e. All of the above

True or False:
Carbohydrate counting is a method that can be used to prospectively determine insulin requirements for any particular meal.

CONIVAPTAN (VAPRISOL) Y-SITE COMPATIBILITY

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Background: Conivaptan (Vaprisol) is indicated for treatment of euvolemic hyponatremia in hospitalized patients. Conivaptan's compatibility with other drugs has not been studied; therefore, compatibility information is needed to determine the possibility of y-site administration with other medications.

Objective: The primary objective is to determine the y-site compatibility of conivaptan with medications used in the Intensive Care Unit (ICU) setting. The samples will be evaluated for haze formation, precipitation, and color change through visual inspection, for changes in absorbance through spectrophotometry, and for changes in pH.

Methodology: The following will serve as the control solutions for this study: conivaptan 0.08 mg/ml of 5% dextrose, 5% dextrose, and 0.9% NaCl. The test solutions will consist of 12 agents at concentrations used in clinical practice including argatroban, bivalirudin, dobutamine, dopamine, furosemide, heparin, metoprolol, milrinone, nesiritide, nitroglycerin, nitroprusside, and norepinephrine. All samples will be aseptically prepared and will pass through a 0.22 m filter before mixing. Each mixture will be mixed twice with the order of mixing reversed for each sample. Samples will be prepared at room temperature, ambient light, and 18-24% humidity. Visual evidence of haze formation, color change, and precipitation will be assessed without magnification against a black and white background. Evaluation of absorbance of visible light with a spectrophotometer, pH testing with an ion analyzer, and visual inspection will be conducted with samples immediately after mixing, and at 1, 4, and 8 hours after mixing. The analysis of results will include each of three tests performed and an evaluation of the differences between the samples at each time point evaluated (0, 1, 4, 8 hours), and the differences among individual samples over time.

Results: The results are to be determined and will be presented at Great Lakes Pharmacy Resident Conference..

Learning Objectives:

Review the indication and stability of conivaptan.

Determine the y-site compatibility of conivaptan with medications used in the ICU setting.

Self Assessment Questions:

True or False: Conivaptan is FDA-indicated for the treatment of hypovolemic hyponatremia.

True or False: Conivaptan is stable when mixed in dextrose 5%.

ANALYSIS OF ADHERENCE TO CHEMOTHERAPY REGIMENS AT AN URBAN ACADEMIC MEDICAL CENTER

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Purpose: Recently, much emphasis has been placed on the need to give chemotherapy according to the planned dose and schedule for the respective regimens. The objectives of this study are: 1) To compare the frequency of dose reductions, delays, and early termination of chemotherapy between Blacks and other minorities to Whites receiving chemotherapy; 2) To determine the reasons for dose reductions, delays, and early termination in Blacks/other minorities and Whites; 3) To compare the frequency of and reasons for dose reductions, delays, and early termination in the curative setting versus the setting of advanced or metastatic disease; 4) To determine if dose reductions occurred in the first cycle due to obesity; 5) To determine the patterns of use of myeloid growth factors in the curative and advanced disease setting; 6) To determine the frequency of dose reductions and/or delays in patients receiving and not receiving myeloid growth factors.

Methods: A retrospective chart review of adult patients diagnosed with a solid malignancy or lymphoma who have received chemotherapy between September 2004 and September 2006. Subjects will be excluded if they are less than 18 years of age or if they received single agent targeted biotherapy. The electronic medical record will be reviewed to ascertain the subjects' demographic information and pertinent history including cancer diagnosis, date of diagnosis, and current treatment. The patient's ideal body weight and body surface area will be calculated, which will determine if initial dose reductions occurred due to obesity. A comparison of the subjects' planned chemotherapy doses and dosing schedule versus the actual doses and dosing schedule received will be made. The prevalence of reduced dose intensity will be determined based on this data. The reason(s) for dose reductions or dose delays will be collected. Use of myeloid growth factors will also be evaluated.

Results/Conclusion: Pending.

Learning Objectives:

Describe the frequency of dose reductions, delays, and early termination of chemotherapy at an urban academic medical center.

Compare the reasons for chemotherapy dose reductions, delays, and early termination between Blacks/other minorities and Whites at an urban academic medical center.

Self Assessment Questions:

True or False: Studies have shown that African-Americans (Blacks) have decreased survival rates in breast cancer even after stage at diagnosis and biological factors are controlled.

List the top 3 reasons for chemotherapy dose reductions, delays, and early termination.

A TEN-MONTH RETROSPECTIVE REVIEW OF INTRAVENOUS LEVETIRACETAM USAGE IN AN ACADEMIC MEDICAL CENTER

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Background: Intravenous levetiracetam was approved by the Food, Drug, and Administration (FDA) in 2006 as adjunctive therapy in the treatment of partial onset seizures in adults with epilepsy. The injection is intended as an initiation or maintenance alternative for patients when oral administration is not feasible. Intravenous levetiracetam has not been studied for use in patients in acute epileptic episodes. Intravenous levetiracetam has not been approved for status epilepticus.

Methodology: Prior to commencement, this retrospective review will be submitted to the IRB. The health-system's pharmacy information system will be used to identify patients who received intravenous levetiracetam on a non-formulary basis between January 2006 and November 2006. During the month of November and December 2006 physician education sessions were conducted by clinical pharmacists on prescribing recommendations for intravenous levetiracetam. In January 2007, intravenous levetiracetam was added to the medical center's formulary of acceptable drugs. A post-education evaluation of physician prescribing practices will be conducted to determine the effectiveness of the physician education sessions. From the medical record, demographic and clinical information, including indication for therapy, additional antiepileptic medications, NPO status, laboratory values, dosing information, and reason for discontinuation, will be recorded using an online database. The incidence of prescribing intravenous levetiracetam outside of Pharmacy and Therapeutics recommendations will be evaluated and medical services will be identified that require additional physician education. Data will be recorded without patient identifiers and confidentiality will be maintained. Data collected will be used in developing a prospective health-system-wide medication use evaluation designed to modify prescribing criteria.

Learning Objectives:

Evaluate the appropriateness of prescribing intravenous levetiracetam in an academic medical center

Identify physician education techniques and guidelines that improve appropriateness of prescribing intravenous levetiracetam

Self Assessment Questions:

The total daily dose and frequency for intravenous levetiracetam is equivalent to the oral dose. T or F

Levetiracetam is more likely to produce or be subject to pharmacokinetic interactions than most antiepileptics. T or F

RISK OF AMINOGLYCOSIDE-INDUCED OTOTOXICITY IN PATIENTS WITH CYSTIC FIBROSIS

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Background: Aminoglycoside antibiotics are commonly used in high-dose, repeated courses in patients with cystic fibrosis (CF) for chronic, recurrent gram-negative infections. Aminoglycosides are useful in treating pulmonary infections due to Pseudomonas aeruginosa, a common colonizer in CF patients. Patients with cystic fibrosis are exposed to a high cumulative level of aminoglycosides, likely predisposing them to aminoglycoside-induced ototoxicity. Risk factors associated with aminoglycoside toxicities include a history of multiple courses, prolonged duration of therapy, higher total daily doses, concurrent nephrotoxic or ototoxic agents and dehydration. Most research into CF patients was conducted in pediatric populations. Northwestern Memorial Hospital's CF patients provide the opportunity to further study aminoglycoside ototoxicity in adults.

Purpose: The purpose of this study is to identify potential risk factors for ototoxicity associated with aminoglycoside use in this population, such as specific aminoglycoside used, dose, duration, and number of courses, concomitant medications, comorbid disease states or patient demographics. Identifying such factors could in turn lead to effective strategies for minimizing such toxicity both in CF and non-CF patients. A secondary objective is to obtain a description of characteristics of those individuals that did develop ototoxicity.

Methods: Adult cystic fibrosis patients at Northwestern Memorial Hospital who received aminoglycoside antibiotics between January 2004 and December 2006 will be the study population in a case-control design which will be a retrospective chart and medication history review utilizing electronic medical records to identify potential risk factors as outlined above. Patients who developed ototoxicity will serve as cases while all other adult CF patients who did not develop ototoxicity will serve as the control group.

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

Learning Objectives:

Discuss the potential mechanisms for and characteristics of aminoglycoside-induced ototoxicity.

Identify potential risk factors for aminoglycoside-induced ototoxicity and develop a strategy for clinically managing CF patients with such risk factors that must receive aminoglycosides.

Self Assessment Questions:

It is believed that aminoglycoside-induced ototoxicity is due to:
a.Aminoglycoside-induced damage to the auditory nerve
b.Aminoglycoside-induced damage to the auditory cortex
c.Apoptosis of outer hair cells and type I vestibular hair cells
d.The mechanism is unknown

Cystic Fibrosis patients are potentially more prone to aminoglycoside-induced ototoxicity because:
a.They often receive multiple courses of aminoglycosides
b.They often receive higher doses of aminoglycosides
c.There is often a short interval between courses
d.All of the above

INCIDENCE OF CONTRAST INDUCED NEPHROPATHY IN A CARDIAC CATHETERIZATION LAB

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Background: Radiographic contrast media (CM) are widely used in medicine for imaging during diagnostic and therapeutic procedures. The variety and volume of procedures utilizing intravascular CM, particularly in cardiology, are increasing. Toxicities attributed to contrast media include cardiovascular and renal toxicity. Several mechanisms of renal toxicity have been suggested. Acute renal failure, secondary to contrast induced nephropathy (CIN), is associated with an increased risk of death and continues to be discussed in the literature.

Objective: The incidence of CIN at Summa Health System (SHS) is unknown and this study shall: 1) Determine the incidence of (CIN) associated with heart catheterizations at Summa Health System in the first quarter of 2006 and compare this with published PCI related CIN data, 2) contrast and compare baseline characteristics such as BMI, presence of co-morbidities, etc. of patients who do not experience CIN versus those who do, 3) contrast and compare procedural characteristics for patients with CIN versus those without (e.g. volume of contrast, pre-procedure infusions), 4) use identified risk factors in the development of standardized risk assessment criteria for patients undergoing PCI at Summa.

Methods: A SHS database maintained by a cardiology practice will be utilized for data acquisition that will be in sorted and analyzed using Microsoft Excel. Additional data sources will include pharmacy computer profiles and electronic patient chart records. All patient data recorded for PCI procedures during the first quarter of 2006 will be analyzed for presence or absence of contrast induced nephropathy as defined by: A) Relative increase of serum creatinine of 25% versus baseline (pre-procedure) within 72 hours after procedure OR B) Absolute increase of serum creatinine of 0.5 mg/dL versus baseline within 72 hours after procedure

Results and conclusions: Data collection and analysis is ongoing. Results and conclusions will be reported at the conference.

Learning Objectives:

Describe the incidence and contributory factors associated with contrast medium induced nephropathy.

At your institution, identify what patient population characteristics that could be predictive of nephropathy for patients undergoing intravascular contrast media exposure.

Self Assessment Questions:

The utilization of low-ionic and non-ionic contrast media has reduced the incidence of contrast induced nephropathy to the point that it rarely (<1%) occurs today. T/F

What actions can be taken to prevent contrast induced nephropathy in patients identified at risk?

QUALITY OF ANTITHROMBOTIC THERAPY FOR THE TREATMENT OF VENOUS THROMBOSIS: A RETROSPECTIVE COHORT EVALUATION

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Purpose

Venous thromboembolism (VTE) is a serious and potentially fatal medical complication in the United States with more than one-third of the cases representing recurrence. In 2004, the Joint Commission on Accreditation of Health-Care Organizations and the National Quality Forum began to establish a set of standardized inpatients measures, known as the "National Consensus Standards for the Prevention and Care of Venous Thromboembolism," that would evaluate health care practices for the treatment of this complication. The purpose of this study is to portray a snapshot of our institution's approach to the treatment of VTE to examine if we compliant with these measures.

Methods

Approval by the Institutional Review Board, consecutive subjects with a diagnosis of an acute VTE at the University of Illinois Medical Center at Chicago (UIMC) between June 1, 2005 and June 30, 2006 were included in our analysis. Exclusion criteria involved: subjects 18 years or older initially treated with either unfractionated (UFH) or low-molecular weight heparin (LMWH) with an indication for long-term anticoagulation with warfarin. Additionally, all patients must have received follow-up care at UIMC. Pregnant subjects and those lost to follow-up were excluded. We obtained the following from the subjects' medical record: demographics, length of hospitalization, type of VTE, anticoagulant used, loading and maintenance treatment doses of UFH, time to therapeutic intervals with either the activated partial thromboplastin time or international normalized ratio (INR), number of overlap days with (UFH)/(LMWH) and warfarin, anti-Xa levels, discontinuations of therapy, INRs at discharge and follow-up appointments, recurrence, mortality, and other adverse events.

Preliminary Results

118 patients were evaluated, aged 19 to 97 years old, 50% with pulmonary embolism and 49% with deep vein thrombosis; detailed results will be reported at the Great Lakes Pharmacy Resident Conference.

Conclusions

The conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

To assess the efficacy of our pharmacologic interventions in the treatment of venous thromboembolism in fulfilling the quality measures identified by the National Consensus Standards for the Prevention and Care of Venous Thromboembolism.

To examine the incidence of complications experienced with antithrombotic therapy.

Self Assessment Questions:

Currently, the National Consensus Standards for the Prevention and Care of Venous Thromboembolism consists of _____ measures.

True or False

_____ Less than one-third of venous thrombolic events represent recurrence.

EVALUATION OF DARBEPOETIN USE IN A COMMUNITY HOSPITAL

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Background: Anemia is a common disease found in patients with chronic renal failure and those receiving chemotherapy. Darbepoetin is a colony stimulating factor used to treat anemia associated with chronic renal failure and chemotherapy. Due to its prolonged biological activity, darbepoetin can be administered on a weekly basis. Increased hemoglobin levels are not generally observed until two to six weeks after initiating treatment. Iron deficiency is the most common reason for failure of therapy, thus a patient's iron status must be monitored before and during treatment with darbepoetin. Currently, there is no anemia management protocol at Saint Margaret Mercy Healthcare Center (SMMHC). This study was designed to examine the darbepoetin prescribing practices at SMMHC and to implement an anemia management protocol, using darbepoetin.

Methods: A retrospective medication utilization evaluation (MUE) was conducted in 51 patients treated with darbepoetin between June and July 2006.

Results: Five patients received darbepoetin more than once in a week. Iron studies (serum ferritin and transferrin saturation levels) were obtained in 22 patients during treatment with darbepoetin. However, only 4 of those patients achieved target ferritin (= 100 ng/ml) and transferrin saturation levels (= 20%) prior to initiation of darbepoetin. Only 10 patients received supplemental iron during treatment with darbepoetin. Twenty four patients received blood transfusions during their hospital stay. Overall, 13 patients reached a target hemoglobin of 11 to 12 g/dl, and 6 of those patients reached target hemoglobin levels without blood transfusions. No adverse events were observed.

Conclusion: There were incidences of inappropriate prescribing practices, such as prescribing darbepoetin more than once a week, failure to assess patients' iron status prior to starting treatment with darbepoetin, and lack of supplemental iron therapy in majority of the patients. These findings will be used to formulate recommendations to implement an anemia management protocol.

Learning Objectives:

Define the pathophysiology and prevalence of anemia in chronic renal disease (CKD) patients and patients receiving chemotherapy.

Describe the strategies for improving outcomes related to anemia in CKD patients and patients receiving chemotherapy.

Self Assessment Questions:

True/False. Iron deficiency is the most common reason for failure of erythropoietin therapy.

True/False. Insufficient erythropoietin production is the primary cause of anemia in patients with CKD.

WARFARIN MANAGEMENT:PHARMACIST-RUN CLINIC VERSUS FAMILY PRACTICE

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Purpose: The majority of patients on warfarin therapy are managed by their primary care physician; this approach to warfarin management is considered a standard of care in the United States. However, physician time has become a scare commodity. Available literature largely supports the use of anticoagulation clinics/ warfarin clinics in the management of patients on oral anticoagulant therapy. Studies have shown a sometimes modest, but significant improvement in patients under the care of pharmacists as opposed to "usual care" which refers to primary care physician or cardiologist management. Time spent in target range is improved while number of complications and necessary interventions is decreased. Therefore, cost of health care is decreased. The purpose of this chart review is to evaluate the effectiveness of a pharmacist-run warfarin management clinic versus a family practice physician-managed approach within the same large health care system.

Methods: The study is designed as a retrospective chart review that would look at a twelve month time period for two groups of patients managed on warfarin, one arm via a pharmacist-run clinic and the other through the usual medical care approach at a family medicine office. Subjects were identified per chart review in two physician practices in the local area health system. Subjects were eligible for enrollment into the study if they: were taking warfarin from August 2005 to August 2006, and had been on warfarin for at least two weeks prior to 12-month inclusion period. The two sites manage a comparable number of patients. The primary endpoint is the time that subject PT/INR was within goal range. Secondary endpoints include: number of PT/INR draws, and number and type of provider interventions secondary to warfarin being out of target range. Descriptive and comparative statistical analysis will be used.

Results: As data collection is still in progress, results are pending.

Conclusion: Pending.

Learning Objectives:

Discuss potential advantages of pharmacist-managed warfarin clinic versus practices managed by primary care physicians.

Evaluate the effectiveness of implementing a pharmacist-run warfarin clinic versus a physician-managed approach within the same large health care system.

Self Assessment Questions:

Previous studies have shown that patients on warfarin therapy who are managed by pharmacists (versus "usual care") spend less time out of target INR range. T/F

Most patients have a target INR range of 2.3-3.5. T/F

ASSESSING PATIENT DEFINITIONS OF MEDICATION THERAPY MANAGEMENT WITHIN A COMMUNITY PHARMACY

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Purpose: Marketing medication therapy management (MTM) services has been a struggle for many pharmacies and pharmacists. Pharmacists use MTM terms knowing what to expect from these services. Patients, however, may not know what these terms mean or what to expect from them. The purpose of this study is to learn how patients define MTM-related terms and what they believe to be included in MTM services.

Methods: An anonymous, self-administered survey was developed to assess patient demographics and patients' definitions of selected MTM terms. The selected MTM terms are "comprehensive medication review", "brown bag session", and "prescription medication counseling". To define the selected MTM terms, participants were asked who they would expect to run the program, where they would expect this program to be offered, and what items (ex. providing information about drug interactions, drug side effects, etc.) they would expect to be included or discussed in this program. Study participants were customers of a retail grocery chain within central Ohio, and both patients and non-patients of the retail pharmacy located within the grocery chain were included. Surveys were distributed by study investigators and were completed on a voluntary basis.

Results: 186 completed surveys were collected from seven survey events in varying demographic locations. The data will be analyzed to determine how participants define selected MTM terms. This will assist in fine-tuning the marketing materials for MTM services within a community pharmacy by incorporating terminology patients understand and identify as being important.

Conclusion: The results of the study will provide valuable information for pharmacists, especially within a community setting, to assist in marketing their MTM services. MTM services have already been proven to be very valuable for the patient, but without proper and effective marketing with patient-friendly terminology, patients may not understand the potential value of participation in the service.

Learning Objectives:

To identify the public's perceived definitions of a comprehensive medication review, brown bag session, and prescription medication counseling.

To identify what items should be included and not included in future marketing materials for MTM services.

Self Assessment Questions:

True or False: Consumers believe doctors are the most likely provider of MTM services.

True or False: Over 50% of consumers surveyed expect the "name and description of the medicine" to be included and discussed during a comprehensive medication review, brown bag session, and prescription medication counseling.

RETROSPECTIVE EVALUATION OF THE SAFETY AND EFFICACY OF RECOMBINANT ACTIVATED FACTOR VII IN TRAUMA PATIENTS WITH NONHEMOPHILIA-RELATED HEMORRHAGE

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Recombinant activated factor VII (rFVIIa) has been suggested as an off-label treatment for massive uncontrolled hemorrhage refractory to conventional therapy. Patient characteristics and parameters necessary to guide the clinical use of rFVIIa have not been well established. Furthermore, the acquisition cost of rFVIIa may increase healthcare resource utilization with unclear benefits. The primary objective of this study is to determine the safety and efficacy of rFVIIa in recipient-trauma patients compared to a matched, non-recipient trauma control group. The secondary objective is to describe the clinical characteristics of all surgical patients who received rFVIIa.

This retrospective study will be conducted at the University Hospital in Cincinnati, Ohio and has been approved by the local Institutional Review Board. All nonhemophilia surgical patients who received at least one dose of rFVIIa between November 2, 2003 and February 28, 2007 will be identified. Trauma patients who received rFVIIa (study group) will be compared to a matched cohort of trauma patients who did not receive rFVIIa. Control patients will be identified through the local trauma registry and matched (2:1) to study group patients based on: mechanism of injury; type of injury; severity of injury; sex; age; admission lactate concentration or base deficit; and number of units of packed red blood cells transfused within 4 hours from bleeding event. Outcomes to be assessed include in-hospital mortality, intensive care unit and total hospital lengths of stay, total pharmacy and hospital charges, and in-hospital thrombotic events. Additional information collected for all rFVIIa patients includes: rFVIIa usage, number and type of blood products administered relative to time rFVIIa was administered, magnitude of coagulopathy, and time to correction of coagulopathy.

Data collection, study outcomes and evaluations are currently underway. Results will be used to establish guidelines for use of rFVIIa in patients with nonhemophilia related hemorrhage.

Learning Objectives:

Describe the hemostatic response to hemorrhage

Review the pharmacology of recombinant activated factor VII and the rationale for use in trauma patients

Self Assessment Questions:

True/False Acidemia, hyperthermia and coagulopathy comprise the lethal triad of hemorrhage

True/False A safety concern for use of rFVIIa in nonhemophilia related hemorrhage is the potential for thromboembolic events

QTC PROLONGATION EFFECTS SEEN IN PATIENTS ON CHRONIC METHADONE THERAPY AND CONCURRENT QTC PROLONGING AGENTS

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BACKGROUND: Methadone is one of the first line agents used to treat chronic pain in patients at the Veterans Affairs Ann Arbor Healthcare System (VAAAHS). It is generally thought to be safe and effective, but has recently been associated with QTc interval prolongation and the development of torsades de pointes. However, a consensus has not been reached as to whether routine electrocardiograph (EKG) testing should be done. Many of these patients are also on other medications (antiarrhythmics, typical antipsychotics, atypical antipsychotics, tricyclic antidepressants, selective serotonin reuptake inhibitors, macrolide antibiotics, and fluroquinolone antibiotics) which may also prolong QTc interval or inhibit the metabolism of methadone via Cytochrome P450 (CYP450). Additionally, patients may have other risk factors predisposing them to elevations of QTc interval. The additive effects of all these factors may cause increases in the risk of ventricular arrhythmias (including torsades de pointes), syncope, and sudden cardiac death. To date, extensive studies have not been done to determine the prevalence of concurrent methadone prescribing with other classes of QTc interval prolonging agents. This study examines the prevalence of this concurrent prescribing and degree of QTc interval prolongation seen in methadone treated patients at VAAAHS.
METHODS: This single-center, retrospective study examined patients with active outpatient prescriptions for methadone prescribed between July 1st, 2005 and June 30th, 2006 . The following information will be collected from chart review: patient age at initiation of methadone, presence of EKG and QTc interval prior to initiation of methadone, and subsequent EKGs with associated QTc intervals. Additionally, at the time of each EKG, methadone dose, presence of other classes of QTc interval prolonging medications, presence of potential major and moderate inhibitors of CYP450 3A4, and presence of potential risk factors will be collected.
RESULTS & CONCLUSIONS: To be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Primary:
1. To determine the prevalence of concurrent prescribing of methadone and other classes of QTc interval prolonging medications.

Secondary:
1. Determine if methadone prolongs QTc interval.
2. Ascertain if the concurrent use of methadone with other classes of QTc interval prolonging medications prolongs the QTc interval greater than methadone alone.
3. Determine if methadone is concurrently prescribed with strong and/or moderate inhibitors of Cytochrome P450 3A4 (CYP3A4) isoenzyme system.
4. Ascertain if the concurrent use of methadone with strong and moderate inhibitors of CYP3A4 increases the QTc interval greater than with methadone alone.
5. Determine if the dose of methadone is associated with a prolongation of the QTc interval.
6. Determine if the QTc interval is prolonged in patients who have additional risk factors for QTc interval prolongation.

Self Assessment Questions:

Methadone has not been found to be associated with an increased risk of QTc interval prolongation and torsades de pointes. True/False

Methadone is used to address acute pain only in patients. True/False

ADHERENCE TO LONG-ACTING FORMULATIONS OF ANTIPSYCHOTIC MEDICATIONS AND THE INCIDENCE OF PSYCHIATRIC-RELATED HOSPITALIZATIONS

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Background
Adherence to medication regimens is an important component of treatment strategies, regardless of the disease or condition being treated. While adherence rates across the board are far from perfect, there are higher risks associated with certain disease states. In patients with psychiatric disorders, lack of treatment can lead to severe consequences ranging from increased risk of relapse and hospitalization to delayed time to remission and even attempted suicide. This lack of treatment can be caused by many factorsone of the most contributory being adherence.

Purpose
A correlation between adherence to oral antipsychotic medications and risk of hospitalization has been demonstrated in many recent studies. This study will address levels of adherence to long-acting injectable formulations of these medications to see if strict adherence correlates with decreased hospitalizations. If a correlation is found, this would support pharmacist management of patient medication regimens to boost adherence, and in turn, decrease hospitalizations.

Methods
A retrospective review will be conducted using the NCVAMC computerized chart program. All eligible outpatient charts will be evaluated to collect all dates of long-acting injection administration and all hospital admission information. The frequency of administration will be compared against the patient's prescribed regimen and assessed for level of adherence. Adherence will be calculated using the patient's prescribed dosing interval and the number of days since their last injection. After calculating an adherence value for each patient, these values will be distributed into percentiles: above 75th percentile, 50th-75th percentile, or below 50th percentile (strict, partial, and non-adherence, respectively). It is hypothesized that patients falling into the strict adherence category will have fewer psychiatric hospitalizations.

Results/Conclusions
Research in progress. Results will be presented at the Great Lakes Residency Conference.

Learning Objectives:

To describe how variations in adherence levels can affect overall patient outcomes, focusing specifically on long-acting injectable antipsychotics and psychiatric hospitalizations.

To demonstrate the need for pharmacist intervention to directly increase adherence to long-acting injectable antipsychotics by taking on some responsibilities that patients are currently forced to carry in an outpatient VAMC setting.

Self Assessment Questions:

T/F: The more psychiatric relapses a patient has, the more difficult it is to bring that patient back into a state of remission.

T/F: Fluphenazine and haloperidol are the two atypical antipsychotics available in long-acting injectable formulations.

EVALUATION OF THE CONSISTENCY OF CONSULT INFORMATION FOR THE NUTRITION SUPPORT SERVICES (NSS) AT AN ACADEMIC MEDICAL CENTER

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Background:
It is important to accurately assess the nutritional status of patients in order to provide consistent therapy that is efficacious and avoids complications, such as glucose intolerance and electrolyte imbalances. Current indications for parenteral nutrition (PN) include: inability to consume an adequate oral diet for at least 5 days for patients who are severely malnourished and > 10 days for other patients; intolerance to oral nutrition when post -pyloric access is contraindicated; and documented evidence of an impaired gastrointestinal tract not likely to resolve in 5-10 days. Criteria used to assess these patients include their height, weight, past medical history, nutritional history and clinical conditions that affect nutritional status.

Purpose:
The purpose of this study is to determine the consistency of information supplied on NSS consults for patients with multiple admissions at an academic medical center receiving PN.

Methods:
Prior to commencement of this study, Institutional Review Board approval will be obtained. This study is a retrospective review examining all patients receiving more than one course of PN during separate hospital admissions from January to July 2006. The patients will be identified from the TPN2006 NSS performance improvement Excel file database. Eight patients from the Arthur G. James Cancer Hospital and seventeen patients from University Hospital will be included for evaluation. Five sections of NSS consults will be evaluated for consistency: height, weight, past medical history, recommended caloric and protein requirements, and parenteral nutrition base formula.

Results:
Results and recommendations for improvement will be presented at the conference

Learning Objectives:

Explain the importance of having consistent information on NSS consults when evaluating a patient for PN

Describe methods to minimize the inconsistency in information found on NSS consults

Self Assessment Questions:

All of the following criteria on NSS consults are essential to evaluate a patient needing PN: Height; Weight; Past Medical History; Recommended caloric and protein requirements; Parenteral nutrition base formula (T/F)

Using a database to enter in NSS consults can improve care coordination for patients with multiple admissions needing PN (True/False)

EFFICACY OF N-ACETYLCYSTEINE VERSUS OCTREOTIDE IN THE TREATMENT OF HEPATORENAL SYNDROME

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Purpose: Hepatorenal syndrome (HRS) is a complication of severe liver disease resulting in reduction of kidney function. Patients have been treated with vasoconstrictors, catecholamines, albumin, and other pharmacologic agents in an attempt to reverse HRS or improve liver and kidney function. N-acetylcysteine (NAC), a scavenger of oxygen free radicals, was studied in 12 HRS patients; the results were promising and showed significant increases in creatinine clearance and decreases in serum creatinine. If an effective drug regimen is identified, morbidity and mortality of HRS patients may be reduced. This case-control study retrospectively compares the efficacy of a NAC-containing regimen (case) with the traditional HRS regimen (ie, octreotide, midodrine, and albumin) in hospitalized HRS patients.

Methodology: This study was conducted at the University of Illinois Medical Center at Chicago using their electronic medical records system. Thirty patients in each group will be identified based on drug codes for HRS therapies and service type (liver service). Collected information includes: patient demographics, past medical history, medications, vitals, serum and urine electrolytes, liver function tests, coagulation parameters, fluid status, HRS treatment and duration of therapy, and patient outcomes. Using appropriate parametric and non-parametric tests, we will evaluate if either of the treatment regimens has a significant effect on different clinical or laboratory parameters. P-value < 0.05 will be considered statistically significant.

Results/Conclusions: At present, 25 cases and 11 controls have been identified. Data has been collected on 18 patients. Most patients are males (mean age of 54 years) with alcoholic cirrhosis. The mean serum creatinine one day after treatment was initiated and one week after treatment was discontinued were 2.3 mg/dL and 2.3 mg/dL respectively in the NAC group and 3.9 mg/dL and 3.6 mg/dL respectively in the octreotide group. Complete results and conclusions will be presented at the conference.

Learning Objectives:

Describe the purpose of the treatment regimens used for HRS.

Determine the difference in outcomes for the two HRS regimens.

Self Assessment Questions:

What are the diagnosis criteria for HRS?

T/F All HRS patients are treated with midodrine.

PHARMACY INTERVENTIONS TO REDUCE THE USE OF SELECT MEDICATIONS IN ELDERLY PATIENTS

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PURPOSE

Elderly patients are exceptionally vulnerable to suffering adverse drug reactions (ADRs). Certain medications are more prone to causing ADRs in the elderly, and are labeled inappropriate,' or the risk involved in their use outweighs potential benefit. Nationally, the frequency of inappropriate prescribing remains high. Within Aurora Health Care, this project will serve to standardize care between Acute Care for the Elderly (ACE) and General Medicine units. The primary objective of this project is to reduce the use of the targeted medications for elderly patients admitted to an inpatient general medical unit at Aurora St. Luke's Medical Center (ASLMC).

METHODOLOGY

This study proposal was submitted to a pharmacy project council and the Institutional Review Board (IRB) and discussed with geriatric specialists prior to commencement. Three of the most problematic Beer's list medications employed at ASLMC were identified [diazepam, meperidine, and haloperidol] via a literature review, the ADR reporting system, and a baseline medication utilization evaluation (MUE). The targeted medications were flagged in the pharmacy order entry system at ASLMC, and a standardized note-on-chart was created. Education and pocket-reference-cards were provided to pharmacy and nursing.

The MUE process will be utilized to measure pre- and post-intervention prescribing indicators at ACE units at Aurora Sinai Medical Center (ASMC) and General Medicine units at ASLMC. The frequency of inappropriate medications will be analyzed, and relevant conclusions will be made.

PRELIMINARY RESULTS

The baseline MUE suggested that there is opportunity to reduce the use of targeted medications on General Medicine units at ASLMC. Post-interventional data collection is in progress.

CONCLUSIONS

The final results and conclusions of this study will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Recognize the incidence and significance of adverse drug reactions in the elderly inpatient

Describe the physiologic changes in aging that affect pharmacokinetics and pharmacodynamics

Self Assessment Questions:

Define the "Beer's list" medications, and name 3 medications that are frequently associated with adverse drug reactions in the elderly.

List 3 factors that make elderly patients more vulnerable to medication toxicities.

IMPROVING MEDICATION SAFETY AND CENTRAL PHARMACY EFFICIENCY WITH AUTOMATED BULK PACKAGING AND SUPPORTIVE BAR CODING SOLUTIONS

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Background: Since its introduction, medication bar coding has promised to profoundly improve the efficiency and safety of drug distribution and administration processes in health care. The realization of these benefits is becoming more tangible as scanning and labeling technologies develop and become increasingly reliable and cost-effective. Pressure for health systems to incorporate bar coded medication administration (BCMA) systems into their patient care model has never been higher. Automated packaging technologies were developed to increase packaging efficiency and accuracy while maintaining or reducing the technical and pharmacist labor demands required for activities associated with medication bulk packaging. The University of Wisconsin Hospital and Clinics pharmacy department currently uses technician labor to operate their centralized semi-automated packaging technologies. These activities supply bar coded unit doses to be used for restocking of centralized and decentralized automated dispensing systems which ultimately support the BCMA system.

Objective: The objective of this project is to implement a fully automated and networked packaging system and measure its impact on pharmacy technician labor, workflow efficiency, on-hand medication inventory carrying costs, and inventory turns.

Methods: Using pre- and post-implementation data obtained by direct observation, we will evaluate the time technicians spend performing the variety of tasks involved with the bulk packaging process. The combined effect that this technology has on medication administration scanning rates in conjunction with a new extemporaneous bar code labeling system will also be evaluated through a pre- and post-implementation data analysis. Lastly, we will evaluate how this technology impacts full-time technical labor requirements in an automated packaging system versus a semi-automated medication packaging system.

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

Learning Objectives:

Explain the process and challenges encountered when implementing automated bulk packaging technology.

Identify and compare packaging workload efficiencies gained or lost when utilizing networked packaging automation.

Self Assessment Questions:

List the inventory management benefits that can be realized when using networked bulk packaging automation to support dispensing technologies with integrated inventory management software?

How can networked bulk packaging automation improve compliance with medication management standards and enhance patient safety?

ASSESSMENT OF CLOPIDOGREL UTILIZATION IN A VETERANS AFFAIRS (VAMC) POPULATION IN COMPARISON TO THE NATIONAL VA GUIDELINES.

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Purpose: Clopidogrel is an antiplatelet agent used as an alternative to aspirin and sometimes in conjunction with aspirin to reduce atherosclerotic events. Currently, approximately 6.3% of patients at the Milwaukee VAMC are prescribed clopidogrel, with an annual cost of $400,000. The Veterans Integrated Service Network (VISN) 12 goal for clopidogrel utilization is =6% of all pharmacy patients, based on national clopidogrel utilization data for the VA system. This project will aim to evaluate appropriate use and prescribing behavior for clopidogrel by providers at the Milwaukee VAMC. In addition, interventions will be made when prescribing does not coincide with evidence based indications for clopidogrel.

Methods: Prior to initiating the study, a proposal was submitted to the Institutional Review Board for approval. The health system's computerized patient record system will be used to identify all patients with active prescriptions for clopidogrel. A retrospective
chart review will be performed for patients currently receiving clopidogrel. Patient information such as duration of clopidogrel therapy, indication, stent and type, and other concurrent anti-platelet and anticoagulation medication use will be entered into a computerized database. Patients will be analyzed for appropriate indications for, and duration of clopidogrel based on the Seventh ACCP Conference on Antithrombotic and Thrombolytic Therapy (CHEST) guidelines, VA guidelines, American Stroke Association guidelines, and the Clopidogrel for High Atherothrombotic Risk and Ischemic Stabilization, Management, and Avoidance (CHARISMA) trial. If use that does not coincide with these guidelines is identified, a progress note consisting of patient evaluation and evidence based recommendations will be entered into the patient's chart for review by the prescribing provider. Patients who were deemed to be prescribed clopidogrel inappropriately will be followed to assess whether the provider changed his or her practice.

Results/Conclusions: Data collection is still in progress. Complete results and conclusions will be presented at the conference.

Learning Objectives:

Discuss appropriate indications for clopidogrel.

List appropriate agents for prevention of ischemic stroke.

Self Assessment Questions:

TRUE or FALSE: Clopidogrel has been shown to be superior to aspirin in preventing ischemic stroke.

Which three antiplatelet agents are recommended for secondary prevention of stoke in patients who have had a stroke?

EVALUATION OF GI PROPHYLAXIS/ACID SUPPRESSION USE IN INTERNAL MEDICINE SERVICE PATIENT POPULATION BEFORE AND AFTER MEDICAL RESIDENT INSERVICE

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Background:
Stress related mucosal damage is superficial lesions that affect the mucosal layer of the stomach that occur after stressful events. This occurs days after the event when the healing process has not improved or the underlying disease state has not been corrected.
Over 100 studies have been published on the topic of stress ulcers in hospitalized patients. The majority of these studies showed that there was an overuse of acid suppressive therapy in hospitals. Patients discharged on acid suppression therapy are more likely to be prescribed inappropriate stress ulcer prophylaxis upon readmission to the hospital. The primary purpose of this study is to assess the proper usage of acid suppression therapy in non ICU hospitalized patients.

Methods
A retrospective chart review of 100 patients prior to pharmacist intervention and another 100 patients following intervention will be reviewed to compare data. Intervention consists of education to medical personal on appropriate prescribing for stress ulcer prophylaxis. Subjects are random patients from Methodist hospital that have been admitted to the internal medicine service. All patients will be assessed for appropriate use of acid suppression therapy. Outcomes will also include if the patient was adequately started or resumed on an agent for stress ulcer prophylaxis.

Learning Objectives:

Understand the criteria for appropriate stress ulcer prophylaxis in non ICU and ICU patients

Understand the proper dose and duration of non ICU patients that met criteria.

Self Assessment Questions:

PPIs inhibit only active proton pumps. True/False

Tolerance does develop in PPIs, like H2-receptor antagonists. True/False

MEDICATION RECONCILIATION IN A PEDIATRIC EMERGENCY DEPARTMENT

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PURPOSE: The importance of a pharmacist in the emergency department has been well documented within the last few years. The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) has included within its National Patient Safety Goals that hospital providers "accurately and completely reconcile medications across the continuum of care." In the Children's Hospital of Wisconsin emergency department (ED), medication reconciliation is performed by the ED nursing staff and medical residents. Currently, pharmacists within our organization do not clarify medication issues until after inpatient ED orders are submitted. The objective of this study is to determine the need for pharmacist intervention in the process of medication reconciliation for pediatric ED patients.

METHODS: A pharmacist will provide services for the Children's Hospital of Wisconsin emergency department for a two month period. This pharmacist will staff the ED from 3 p.m. to 11 p.m. Thursday through Monday. Along with other services provided to the ED, the pharmacist will evaluate medication reconciliation forms completed by nurses and medical residents for accuracy. Data assessed will include: medication name, dose, dosage form/concentration, frequency, route, indication and duration of therapy. Clinical interventions will be made by the pharmacist to prevent medication errors as a result of inaccurate medication reconciliation.

OUTCOMES: The primary outcome of this study is to obtain baseline data regarding accuracy of medication reconciliation in the pediatric ED. Quantity and types of discrepancies within medication lists provided by the ED nurses and medical residents will be evaluated. Number of patient medications listed on completed medication reconciliation form will be considered. Most common pediatric medications upon admission to the ED will be described. Pharmacist interventions regarding medication histories will be discussed.

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

Learning Objectives:

Discuss the importance of mediation reconciliation in pediatric patient safety.

Describe the potential benefit of pharmacist mediated medication reconciliation in the pediatric emergency department.

Self Assessment Questions:

T or F: Medication reconciliation is a formal process for creating the most complete and accurate list possible of all pre-admission medications for each patient and comparing the physician's admission, transfer, and/or discharge orders against that list.

T or F: Inaccurate medication reconciliation is associated with pediatric medication errors in the emergency department.

INVESTIGATING THE BENEFITS OF IMPLEMENTING PHARMACY SERVICES IN AN EMERGENCY DEPARTMENT

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Purpose: In 1999, the Institute of Medicine reported that emergency departments (ED) are among the three hospital departments where high error rates with serious consequences are most likely to occur. Integrating specialized pharmacists into areas of inpatient care has helped institutions to focus on improving patient safety, reducing medication errors, and the most appropriate utilization of drug therapies. Therefore, it seems probable that pharmacy services provided directly in the ED would produce a positive benefit as well. This investigation explored the impact of providing specialized pharmacy services in the ED with goals to improve patient safety, decrease medication related expenses and adverse events, ensure appropriate use and timely administration of medications, and to improve physician, nursing, and patient satisfaction.

Methods: A pharmacy practice resident provided direct pharmacy services to patients and staff in the ED for six weeks. Specific services included: prospective review of medication orders and medication histories for appropriateness, allergies, and interactions; assistance with development, revision, and implementation of medication and disease-specific protocols; assistance with medication reconciliation efforts; patient education for discharge medications; medication-related education to the emergency center staff; serving as a knowledgeable source for drug information issues; ensuring appropriate acquisition, storage, preparation and dispensing of medications; providing pharmacokinetic dosing services; and assistance with medications during resuscitation efforts. To measure the impact of the services, the resident maintained accurate daily documentation of all interventions and services provided. A survey was also developed and distributed to the ED physician and nursing staff to gather and evaluate their opinions on the usefulness and impact of the pharmacy services provided by the resident as well as to gather their suggestions for potential future pharmacy involvement in the ED.

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

Learning Objectives:

Describe current patient care and safety concerns existing within emergency departments that could be positively impacted by direct pharmacist involvement.

Describe services that a pharmacist could provide that could positively impact patient care practices within emergency departments.

Self Assessment Questions:

True or False: Pharmacists are widely utilized to provide direct pharmacy services in emergency departments.

Which types of services could an ED pharmacist provide to help improve patient safety, reduce medication errors, and ensure appropriate utilization of drug therapies?
a.Patient and staff education
b.Providing drug information
c.Pharmacokinetic dosing
d.Medication reconciliation
e.All of the above

A RETROSPECTIVE AND CONCURRENT EVALUATION OF RECOMBINANT FACTOR VIIA PRESCRIBING AND UTILIZATION FOR THE DEVELOPMENT AND IMPLEMENTATION OF DOSING ALGORITHMS AND RESTRICTIONS

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Since its FDA approval in 1999 for the treatment of bleeding episodes in patients with hemophilia or factor deficiency, recombinant factor VIIa (rFVIIa) usage continues to rise. Recent studies and case reports raise the concern for the potential of rFVIIa to cause thrombotic events, especially with its increasing off-label use. While definitive clinical trials are lacking and varying doses of rFVIIa have been used, clinical judgment remains the mainstay of dose selection for non-FDA approved indications. Questions that remain to be addressed by clinical studies include proper prescribing and dose, number of doses, timing of administration, adjunctive therapies, administration of blood products, and contraindications.

The purpose of this medication use evaluation is to evaluate the prescribing, safety and efficacy of rFVIIa in off-label indications. A retrospective and concurrent chart review will be conducted, from January 2003 - April 2007, in all patients > 17 years who have received at least one dose of rFVIIa at ALGH. Patient cases will be reviewed to examine dosing outcome, indication, and possible complications. Data to be evaluated will also include baseline demographics, renal function, anticoagulant medications, and coagulant factors along with attempts to correct coagulopathy with pre-treatment interventions. In addition, a survey will be performed to gather data on the use of rFVIIa at other institutions nationwide.

As part of this project, rFVIIa will be reviewed for formulary consideration at ALGH. A comprehensive literature review will allow for the development of dosing algorithms and/or guidelines for the use of rFVIIa in appropriate clinical situations. Furthermore, education will be provided for corresponding healthcare staff on appropriate practice, dosing, and monitoring.

Data collection and analysis is ongoing. Preliminary results and conclusions will be presented.

Learning Objectives:

To describe the associated complications following the administration of rFVIIa.

To identify an appropriate place in therapy for the off-label use of rFVIIa.

Self Assessment Questions:

Potential adverse effects following the use of rFVIIa include:
(a) Myocardial infarction
(b) Arterial and venous thromboembolism
(c) Acute renal failure
(d) All of the above

Recombinant Factor VIIa is a vitamin K-dependent glycoprotein that promotes hemostasis by complexing with tissue factor and activating coagulation factors in the intrinsic pathway.
(a) True
(b) False

PARENTERAL NUTRITION EXPOSURE IN HEMATOPOIETIC STEM CELL TRANSPLANT PATIENTS

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Purpose: Significant nausea, vomiting, mucositis, diarrhea, weight loss, and fluid and electrolyte disorders are adverse events associated with the high dose chemotherapy used for hematopoietic stem cell transplant (HSCT). Parenteral nutrition (PN) is used to provide nutrition to patients who are unable to eat due to these side effects. However, PN may increase the risk of infection in an already immunocompromised patient population. Sheean et al (2006) demonstrated HSCT patients receiving PN were = 2 times more likely to become infected than were non-PN recipients after controlling for several factors including donor type, diagnosis, mucositis, and obesity.

The purpose of this evaluation is to determine the use of PN in patients who receive a HSCT at The James Cancer Hospital at The Ohio State University Medical Center. Secondary goals are to examine the occurrence of hyperglycemia, hyperlipidemia, and infections in HSCT patients receiving PN.

Methods: This evaluation is a retrospective analysis of adults who received PN during their initial autologous or allogenic HSCT from August 2005 through July 2006. Patients receiving PN prior to HSCT admission are excluded from the study. Admission demographics including baseline cardiac, renal, and hepatic function as well as age, height, and weight measurements will be collected. Transplant-specific data consisting of diagnosis, preparative chemotherapy regimen, type of HSCT, and time to white blood cell and platelet engraftment will be evaluated. PN data will incorporate the PN base formula, volume, and duration of therapy as well as assessment of nutritional status. Blood glucose will be determined from morning blood draws and serum lipids will be monitored weekly. Microbiologic cultures will be monitored for infections. Finally, corticosteroid administration will be included in the analysis.

Results: Data collection is in process. Data analysis, results, and conclusions will be presented. Therapeutic outcomes will be studied using descriptive statistics.

Learning Objectives:

Assess the benefits and risks associated with parenteral nutrition use in immunocompromised patients

Identify risk factors for parenteral nutrition complications in immunocompromised patients

Self Assessment Questions:

What is the incidence of parenteral nutrition use in this study?

What was the risk of infection in hematopoietic stem cell transplant patients receiving parenteral nutrition?

IF I BUILD IT, WILL THEY COME? DETERMINING INTEREST IN MTM SERVICES

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Background
Because Medicare, some private insurance companies and even some employers recognize that people are healthier and have lower overall healthcare costs when they use their medications properly, the Medicare Modernization Act of 2003 has required that all Part D sponsors establish medication therapy management (MTM) programs of some kind for their beneficiaries. Currently, insurance companies and Medicare are studying ways to implement these programs and provide reimbursement, but to be successful, the program will rely on patient motivation and involvement. Since face-to-face interactions are probably the most effective way to counsel, patients must be willing and able to insert one more healthcare appointment into their busy lives in order for MTM services to be valuable.

Purpose
This project is designed to determine if patients are interested in participating in a one-on-one medication therapy management program administered by a pharmacist. It will also attempt to determine what revenue such a program might generate.

Methods
Patients were prospectively identified based on inpatient and outpatient medical records, provider referrals and word-of-mouth. Inpatients were actively targeted based on Medicare-defined criteria: multiple chronic diseases, multiple mediations or the likelihood that they will have $4000 or more in annual drug costs. Information collected during the interview included patient demographics, insurance information, medical and medication history, and a post-interview patient questionnaire. Interviews were conducted in person and patients were instructed to bring all of their medications, herbals, over-the-counter medications and samples to the appointment. The time allotted was determined on a case-by-case basis, with more time being devoted to more complex cases. Information from insurance companies, time spent, and the post-interview patient questionnaire will be analyzed at the end of the study period.

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

Learning Objectives:

To describe patient's attitudes toward a pharmacist administered MTM program.

To discuss the ability of an MTM program to be financially self-sustaining.

Self Assessment Questions:

True or False - The majority of patients thought their quality of life would increase after meeting with the pharmacist.

What was the average length of time spent with each patient?

EVALUATION OF ADHERENCE RATES BEFORE AND AFTER IMPLEMENTATION OF A SEVERE SEPSIS PROTOCOL AT A VETERANS AFFAIRS MEDICAL CENTER.

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Purpose
Despite advances in the treatment of severe sepsis and septic shock mortality rates remain high in the United States. The primary objective of this study is to determine adherence rates to the Surviving Sepsis Campaign (SSC) guidelines before and after implementation of a hospital specific severe sepsis protocol. The protocol will be based upon the severe sepsis resuscitation and maintenance bundles provided by the Institute for Healthcare Improvement (IHI) Saving 100,000 Lives Campaign. The secondary objective is to determine mortality rates among patients with a diagnosis of severe sepsis and/or septic shock before and after initiation of the severe sepsis protocol.

Methods
This study is both a retrospective and prospective evaluation of all patients diagnosed with severe sepsis from October 1, 2005 through April 30, 2007. Patients admitted from October 1, 2005 until the protocol implementation date in February 2007 will be retrospectively evaluated and patients diagnosed with severe sepsis/septic shock after implementation of the protocol will be prospectively evaluated. Relevant data will be extracted from the medical record and recorded on a monitoring form. Data will include demographics and adherence to the severe sepsis resuscitation and maintenance bundles.

Preliminary Results
Of the ninety patients evaluated to date, adherence to SSC guidelines was highly variable at 12% to 86.7% with administration of an adrenocorticotropic hormone (ACTH) stimulation test being the worst and blood cultures drawn before antibiotic therapy being the best. Overall 28 day mortality prior to protocol implementation was consistent with previous reports at 35.6%. Pneumonia and acute abdominal infections were associated with the highest mortality rates.

Conclusions
Prior to implementation of a hospital-wide sepsis protocol, adherence rates to the SSC guidelines were low and mortality rates were consistent with previous reports.

Learning Objectives:

Recognize the need for a standardized severe sepsis/septic shock protocol and the potential benefits from its implementation.

Identify patients with severe sepsis/septic shock and recognize the components of the IHI severe sepsis/septic shock resuscitation and maintenance bundles.

Self Assessment Questions:

Septic shock is defined by which of the following criteria?
A.Known or suspected infection
B.Hypotension, hypoperfusion, and organ dysfunction refractory to fluid resuscitation
C.Signs of the Systemic Inflammatory Response Syndrome
D.All of the above

True or False: The IHI severe sepsis resuscitation and management bundles focus on early goal directed therapy for patients with severe sepsis/septic shock.

EVALUATION OF HYPERTENSION INDUCED BY BEVACIZUMAB IN ONCOLOGY PATIENTS

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Background:
Bevacizumab is a novel agent for the treatment of solid tumors. It is a recombinant monoclonal antibody that inhibits vascular endothelial growth factor (VEGF) to prevent angiogenesis and further exhibit anti-neoplastic activity. Due to its mechanism of action, bevacizumab has unique adverse effects associated with its use, specifically, hypertension. The occurrence of hypertension, depending on the severity, may preclude a patient from receiving additional doses of this agent.

Purpose:
The purpose of this study is to assess the incidence and severity of hypertension induced through the use of bevacizumab and to devise a treatment/management recommendation.

Methods:
This retrospective study has received approval from the Human Investigations Committee at Wayne State University. A pharmacy usage report was generated to identify all patients that have received more than one dose of bevacizumab from January 2005 through December 2006. Patients younger than 18 years of age were excluded from the study. The following data are collected through medical chart review: patient age, gender, ethnicity, height, weight, treatment indication, history of hypertension, antihypertensive medications, number of cycles, dosage, infusion time, concurrent chemotherapy, prior chemotherapy, blood pressure, and heart rate. Data collection is currently ongoing and will be completed by March 2007. The incidence of hypertension will be calculated and the severity will be classified according to National Cancer Institute (NCI) Common Toxicity Criteria and the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7). The use of antihypertensive medication will be reviewed for those patients that became hypertensive secondary to treatment with bevacizumab.

Results/Conclusions:
The results and conclusions of this study will be presented at the Great Lakes Pharmacy Conference, April 2007.

Learning Objectives:

List the indications for using bevacizumab in the treatment of solid tumors.

Discuss the proposed mechanism of bevacizumab-induced hypertension.

Self Assessment Questions:

True or False: Bevacizumab is only FDA-approved for use in metastatic colorectal cancer.

True or False: Patients develop hypertension immediately after the first dose of bevacizumab.

OPTIMIZATION OF SEDATION AND ANALGESIA MANAGEMENT FOR MECHANICALLY VENTILATED PATIENTS IN CRITICAL CARE UNITS

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PURPOSE: Agitation and pain management are frequent issues commonly addressed in critically ill patients on mechanical ventilation. The risk of over sedating patients and increasing ventilator duration can lead to complications in patient care. Studies have proven that daily interruptions of sedative infusions have decreased the duration of mechanical ventilation as well as length of stay in the ICU. Riverside Methodist Hospital has pre-approved guidelines that aid in the management of sedation and analgesia with goal-directed recommendations. Previous studies at our institution have shown that daily sedation minimization is not occurring on a routine basis or in a consistent manner. The goal of this study is to improve compliance to the daily sedation minimization protocol. A second goal is to identify any areas in which improvements to the protocol will aid in maximizing compliance.
METHODS: This study will consist of direct observation of current sedation and analgesia management in mechanically ventilated patients in critical care units. Attention will be directed towards choice of pharmacotherapy, documentation of patient assessment (by the Modified Ramsey Sedation Scale-MRSS) and documentation of interventions performed to attain therapeutic goals. The critical care nursing staff will be provided pharmacy-lead in-services to review the sedation minimization protocol and emphasize the importance of compliance. Pharmacists will also assist nursing during daily weaning of sedation. A comparison will be made pre- and post-pharmacist intervention. Measurable parameters will include length of sedative and analgesic infusions, length of mechanical ventilation, percentage of patients with documented daily minimizations and percentage of nursing MRSS scores correlating with pharmacist MRSS scores.
RESULTS/CONCLUSIONS: Data collection is in progress. Results and conclusions of the study will be presented at the conference.

Learning Objectives:

Describe how to adequately assess a patient's level of sedation.

Identify barriers associated with daily sedation minimization compliance.

Self Assessment Questions:

Identify common causes of agitation in mechanically ventilated patients.

Describe the rationale behind choosing a sedative agent for a mechanically ventilated patient and the appropriate titration method to receive desired effects.

EFFECTS OF THE WITHDRAWAL OF CERIVASTATIN ON STATIN COMPLIANCE IN PATIENTS HOSPITALIZED FOR ACUTE CORONARY SYNDROME

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PURPOSE: Robust data exists to support the use of HMG-CoA reductase inhibitors (statins) for secondary prevention of coronary artery disease (CAD). Despite continued statin prescribing by physicians, poor patient compliance continues to contribute to worsened outcomes. Multiple causes of noncompliance have been proposed to explain this phenomenon, with patient beliefs and attitudes shaped by perception emerging as a proposed primary influencing factor. The purpose of our study is to identify the association of cerivastatin withdrawal with follow-up use of other statins in patients after acute coronary syndrome (ACS).

METHODOLOGY: This is a retrospective, observational study of prospectively collected data. Patients were selected from the University of Michigan Health System (UMHS) ACS registry and divided into 3 groups. Group 1 includes patients admitted from May 2000 through April 2001, representing the pre-withdrawal group. Group 2 includes patients admitted from September 2001 through August 2002 and group 3 includes admissions from September 2002 through August 2003, representing the peri-and post-withdrawal groups, respectively. Eligible patients = 18 years of age with a diagnosis of ACS had the following data prospectively collected: demographics, past medical history, symptoms, clinical characteristics and electrocardiogram findings, treatment and in-hospital outcome. Patients must have completed the 6 to 12 month telephone follow-up after registry entry and were excluded if they had an identified contraindication to statins. Drug therapy utilization at discharge and follow-up of statins, aspirin, angiotensin-converting enzyme inhibitors or angiotensin-II receptor blockers, and beta blockers were also measured. Collection of patient demographics (age, gender, cardiovascular-related co morbidities, number of medications, admission statin use, statin contraindication, and ACS type) was also assessed.

RESULTS/CONCLUSIONS: Based upon the data collected, the authors will describe the association between cerivastatin withdrawal and follow-up use of other statins in UMHS ACS patients. Descriptive statistics, as well as bivariate and multivariate analyses will be conducted to analyze data.

Learning Objectives:

Explain the factors associated with patient compliance to statin therapy.

Describe the follow-up use of other statins in ACS patients in association with the withdrawal of cerivastatin in our study.

Self Assessment Questions:

True or False: Patient factors alone determine medication compliance.

True or False: In our study follow-up use of statin therapy around the time cerivastatin was withdrawn was related to a reduction in discharge prescription rates.

EVALUATION OF A LOW, FIXED DOSE OF RASBURICASE FOR THE TREATMENT OF HYPERURICEMIA IN ADULT CANCER PATIENTS

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BACKGROUND:
Rasburicase is used in the management of hyperuricemia associated with tumor lysis syndrome. Hyperuricemia, if not controlled, can lead to crystallization of uric acid in the renal tubules and subsequent uric acid nephropathy. Rasburicase is a recombinant form of the enzyme urate oxidase which oxidizes uric acid to a more soluble metabolite. The use of this agent results in significant reductions in plasma uric acid concentrations within four hours of administration. The FDA approved dosing regimen is 0.15-0.20 mg/kg daily for five days. Recent research has centered on the utilization of rasburicase at lower doses than those approved. However, evidence supporting lower dosing schemes is limited to retrospective analyses and case reports.

PURPOSE:
The primary objective of this study is to determine the uric acid lowering potential of a single, 7.5 mg dose of rasburicase compared to the single, weight based dose (0.15 mg/kg) currently used at our institution.

METHODS:
This study contains a prospective cohort and a retrospective cohort. The prospective cohort consists of patients who received a single, 7.5mg dose of rasburicase. This group was compared to a retrospective cohort of patients who received a single, 0.15 mg/kg dose of rasburicase from December 2005 to December 2006. Data collected include demographic data and uric acid levels (collected at baseline, 12 hours after the dose and daily thereafter). Serum creatinine, potassium, phosphorus and calcium were also collected daily.

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

Learning Objectives:

Describe the rationale behind the use of rasburicase in the prevention and treatment of hyperuricemia secondary to tumor lysis syndrome.

Evaluate the literature supporting the use of rasburicase at doses lower than those FDA approved.

Self Assessment Questions:

List three risk factors for tumor lysis syndrome.

In addition to rasburicase, what other treatment modalities are used to prevent or treat elevations in uric acid associated with tumor lysis syndrome?

CHARACTERIZATION OF HYPOCALCEMIA IN PATIENTS TAKING TYROSINE KINASE INHIBITORS FOR ACUTE AND CHRONIC LEUKEMIAS

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Background: The tyrosine kinase inhibitors imatinib and dasatinib have revolutionized the treatment of Philadelphia chromosome positive chronic myelogenous leukemia (CML). These drugs work by inhibiting the Bcr-Abl tyrosine kinase, the dysregulated tyrosine kinase created by the Philadelphia chromosome. Imatinib therapy produces a complete cytogenetic response in 80-90% of patients treated in early chronic phase of this disease. Dasatinib is approved for the treatment of imatinib-resistant or intolerant patients with Philadelphia chromosome positive CML or acute lymphoblastic leukemia (ALL). Recent reports have documented hypocalcemia in patients receiving imatinib for gastrointestinal stromal tumors (GIST) and hypophosphatemia in patients receiving imatinib for GIST and CML. Objective: The primary objective of this study is to characterize serum calcium and phosphate disturbances in patients taking imatinib or dasatinib for the treatment of Philadelphia chromosome positive leukemias. A secondary objective is to evaluate patient nutritional status and its impact on drug-associated electrolyte disturbances. Methods: Prior to initiation, this study will be submitted to the Investigational Review Board for approval. Subjects for the retrospective chart review will be identified through physician referral from the leukemia clinic. Inclusion criteria consist of Philadelphia chromosome positive CML and ALL subjects receiving imatinib or dasatinib treatment. Data to be collected include: diagnosis, imatinib/dasatinib date of initiation, dose, and duration of therapy, concomitant medications, and serum calcium, phosphate, albumin, parathyroid hormone and vitamin D levels when available. Clinical signs and symptoms of hypocalcemia such as muscle cramps and the addition of supplements will be recorded. Mean serum calcium and phosphate levels prior to imatinib/dasatinib initiation and during treatment will be compared. Nutritional status will be assessed via the indirect marker of calcium to albumin ratio. Results/Conclusion: The results and conclusion of this study will be presented at the Great Lakes Residency Conference.

Learning Objectives:

Describe the mechanisms of action of imatinib and dasatinib and how they relate to the chromosomal abnormality seen in most patients with chronic myelogenous leukemia

Discuss the significance of imatinib to the natural history of chronic myelogenous leukemia

Self Assessment Questions:

Imatinib can be used in the treatment of Philadelphia chromosome positive ALL. T/F

CML patients who become resistant to imatinib will also be resistant to dasatinib. T/F

SINGLE-CENTER, CASE-CONTROL STUDY OF THE EFFICACY AND SAFETY OF DROTRECOGIN ALFA (ACTIVATED) IN SEVERE SEPSIS.

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Background and Purpose: Severe sepsis is a major cause of morbidity and mortality in Intensive Care Units, with mortality rates ranging from 30% to 50%. Until recently, the treatments available for use in sepsis have included antibiotics and supportive care to maintain adequate organ perfusion, ventilation, and nutrition. In 2001, drotrecogin alfa (activated) (DrotAA) became the first therapeutic agent approved by the Food and Drug Administration for severe sepsis associated with organ dysfunction and high risk of death. Approval was granted based upon the results of the PROWESS trial (Efficacy and Safety of Recombinant Human Activated Protein C for Severe Sepsis). This study evaluates the efficacy and safety of DrotAA in a 500-bed tertiary care teaching hospital, as well as assesses the appropriateness of prescribing in accordance with criteria established in the PROWESS trial.

Methods: A retrospective case-control study was conducted of patients initiated on DrotAA for the treatment of severe sepsis between February 2002 and September 2006. Cases included patients 18 years of age or older diagnosed with severe sepsis and treated with DrotAA. Control subjects were treated for severe sepsis as identified by ICD-9 codes 038.0-038.9, 995.92 and 785.52 but did not receive DrotAA. Efficacy and safety assessments include survival and incidence of serious adverse events, respectively. Data collected includes: patient demographics, APACHE II score, systemic inflammatory response syndrome criteria, number of dysfunctional organs, time from first organ dysfunction to the start of DrotAA infusion, dose and infusion duration, site and type of infection, cultures and sensitivities, antibiotic use, use of mechanical ventilation, vasopressor use, corticosteroid use, presence of inclusion/exclusion criteria established in PROWESS, occurrence of serious adverse events as defined in PROWESS and 28 day all-cause mortality.

Results/conclusion: Data analysis is ongoing. Results will be presented at the Great Lakes Pharmacy Residency conference.

Learning Objectives:

Understand the significance of early detection and treatment of severe sepsis.

Discuss the indication for use and dosing of drotrecogin alfa (activated) in severe sepsis.

Self Assessment Questions:

When indicated, drotrecogin alfa (activated) should be:
(a)Started within 36 hours of organ dysfunction, dosed at 24 mcg/kg/hr with the total infusion time of 96 hours
(b)Started within 24 hours of organ dysfunction, dosed at 24 mcg/kg/hr with a total infusion time of 96 hours
(c)Started within 48 hours organ dysfunction, dosed at 48 mcg/kg/hr with a total infusion time of 96 hours
(d)Started within 24 hours of organ dysfunction, dosed at 48 mcg/kg/hr with a total infusion time of 96 hours

(T/F) Drotrecogin alfa (activated) is a potent anticoagulant. Prior to the initiation of therapy a thorough assessment of the patient's bleeding risk should be conducted.

IMPLEMENTATION OF COMPUTER-BASED RENAL DOSING GUIDELINES AT THE POINT OF ORDER ENTRY TO ENSURE APPROPRIATE MEDICATION DOSING

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Purpose:
Many medications require dosage adjustment based on a patient's renal function. Prescribers are often unaware of the need for dose modification or are uncertain of the correct dosages for patients with renal dysfunction. Pharmacists at Meriter Hospital intervene when a dose is inappropriate by automatically adjusting medication doses based on estimated creatinine clearance. However, medication orders that could be adjusted for renal dysfunction may go unnoticed. The purpose of this project is to utilize the technology of the computer order entry system to identify doses of medications that should be adjusted for renal dysfunction. The development of dosing guidelines at the point of order entry will have a great impact on appropriate medication use and implications for successful transition to computerized physician order entry (CPOE).

Methods:
A group of commonly prescribed medications requiring adjustments for renal dysfunction were identified by screening our current renal dosing protocol and formulary. Renal dosing guidelines were determined for each medication based on commonly used references. A dose editing rule function of the computer software (Epic Systems, Verona, WI) was utilized. Individual medication dosing guidelines were set up in the program. When renally adjusted medications are ordered at a dose exceeding the guidelines in place, an alert presents prior to final verification. The alert describes how much the ordered dose exceeds the suggested appropriate dose and what guideline the alert falls under. To evaluate the impact of the dosing guideline alerts, we will compare the proportion of renal dosing interventions made before and after the implementation of the computerized dosing guidelines.

Results and Conclusions:
Data collection is ongoing, and the results and conclusions of this study will be presented at the Great Lakes Pharmacy Resident Conference in April.

Learning Objectives:

Identify medications most commonly adjusted for renal dysfunction.

List the advantages of introducing dosing guidelines to order entry systems.

Self Assessment Questions:

T/F: The Cockcroft-Gault equation for estimating creatinine clearance is the ideal method of estimating renal function in all patients.

Medications that are adjusted for renal dysfunction include:
a. Allopurinol
b. Enoxaparin
c. Famotidine
d. Metoclopramide
e. All of the above

EFFICACY AND SAFETY OF CONTINUOUS INFUSION LABETALOL FOR AORTIC DISSECTION

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Background/Purpose: Aortic dissection is a frequently fatal condition in which a longitudinal tear occurs in the aortic intimal layer. Patients with aortic dissection commonly present in a hypertensive emergency requiring parenteral antihypertensive agents. The goal of therapy is to decrease sheering forces in order to prevent propagation of the dissection and target organ damage. Optimal treatment involves the initiation of both vasodilators and beta-adrenergic antagonists. Labetalol, an alpha1- and beta-adrenergic antagonist, is an alternative to combination therapy. However, literature evaluating the administration of labetalol as a continuous infusion for aortic dissection is lacking. The objective of this study is to evaluate the efficacy and safety of a continuous infusion of labetalol in patients with aortic dissection. The primary outcomes are the time to achieve a target systolic blood pressure (SBP) of < 120 mmHg and a target heart rate of 55-65 beats per minute.

Methods: This study will be conducted as a retrospective case control review including all patients admitted to the coronary intensive care unit diagnosed with aortic dissection over a one-year period. Data that will be collected includes patient demographic factors, baseline blood pressure and heart rate, time of achievement of target blood pressure and heart rate, dose and duration of labetalol infusion, dose and duration of any additional antihypertensive medications, and occurrence of hypotension, bradycardia, or elevated liver function tests. Comparison of efficacy outcomes will be performed between patients that received a continuous infusion of labetalol and a control group consisting of those patients that meet inclusion criteria but did not receive a labetalol infusion.

Results/Conclusions: Data collection is currently in progress. Results and conclusions will be presented at the conference.

Learning Objectives:

Review the pathophysiology and treatment of aortic dissection.

Discuss the role of labetalol in the management of aortic dissection.

Self Assessment Questions:

(T or F) Pharmacologic treatment options for aortic dissection include sodium nitroprusside, fenoldopam, nicardipine, and beta-blockers.

(T or F) The maximum rate of infusion for labetalol is 2 mg/min.

ASSESSMENT OF ANEMIA IN CONGESTIVE HEART FAILURE PATIENTS AT A HEART DISEASE MANAGEMENT CLINIC

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Recently many research studies have addressed the high frequency of anemia in the congestive heart failure population. Currently, guidelines for the treatment of anemia in congestive heart failure are unavailable. Major findings from the literature conclude that approximately half of heart failure patients are anemic. The etiology of anemia was associated with iron deficiency, anemia of chronic disease, hemodilution or renal insufficiency. Anemia was independently associated with mortality, and anemia was more common in New York Heart Association (NYHA) classes III and IV. Current investigational treatments being researched include oral and intravenous iron and subcutaneous erythropoietin.

Purpose: The Congestive Heart Failure Clinic at Riverside Methodist Hospital sees 400 patients on an outpatient basis. The heart disease management clinic team includes a physician, nurse practitioners, nurses and pharmacists. This study will seek to identify the frequency of anemia in the congestive heart failure population of the clinic and pinpoint the patients that are at highest risk for anemia. An anemia evaluation tool will be developed based on the information obtained concerning the high-risk population and used to facilitate treatment.

Methods: A retrospective chart review will be performed on 50 patients. Patient demographic data will include age, gender and weight. Primary diagnosis, past medical history, medication allergies, medication regimens and NYHA class will also be collected. Pertinent laboratory data including hemoglobin, hematocrit, renal function tests and iron studies will be recorded. Upon conclusion of the retrospective chart review the development of an anemia evaluation tool (for placement in the chart) will be implemented with treatment option recommendations when appropriate.

Results: Data collection is currently in process. The data collected in this study will be placed in Microsoft Access and Excel databases but will exclude all patient identifiers. Data analysis, results and research conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:

Describe the etiology, frequency and pharmacotherapy treatment of anemia in the congestive heart failure clinic

Identify the association of anemia with certain patient demographics, medications and co-morbid conditions

Self Assessment Questions:

T/F Current guidelines exist for the treatment of anemia in congestive heart failure.

Which New York Heart Association (NYHA) classes are often associated with anemia?

SAFETY EVALUATION OF VENOUS THROMBOEMBOLIC DISEASE TREATMENT IN BLOOD AND MARROW TRANSPLANT (BMT) AND LEUKEMIC PATIENTS IN A COMMUNITY HOSPITAL

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Objective: Cancer patients have shown a 2 to 6 fold risk of bleeding complications during anticoagulation therapy for venous thromboembolism disease (VTE) compared to patients without cancer. Published clinical trials have used various definitions of thrombocytopenia to qualify the risk for bleeding complications. In March of 2006, the National Cancer Comprehensive Network published guidelines on the treatment of VTE, which defined thrombocytopenia as less than 50,000/L, the point at which anticoagulation is not recommended. Prior to these guidelines, the BMT Unit at Jewish Hospital defined thrombocytopenia during anticoagulation as less than 30,000/L, the point at which platelet transfusion should occur. Because of this difference we plan to evaluate safety of using a transfusion trigger threshold of 30,000/L during anticoagulation for the treatment of VTE by accessing the incidence, severity, and location of bleeding complications and possible correlations with the type of thrombosis, type of transplant, hemoglobin and hemocrit levels, platelet count, anti-factor Xa activity and co-risk factors.

Methodology: The health system electronic pharmacy system was used to identify BMT Unit patients who received therapeutic dalteparin during between May 1, 2003 and September 1, 2006. All patients 18 years and older treated with therapeutic dalteparin were identified. Patients who received prophylactic doses of dalterparin and non-BMT/leukemic patients were excluded. The following data will be collected: age, gender, weight, type of transplant, platelet count, hemoglobin, hemocrit, PT/INR, aPTT, serum creatinine, creatinine clearance, anti-factor Xa activity, location of bleeding, need and number of blood transfusions and platelet transfusions, documentation of CT scan, endoscopy, colonoscopy, or bronchoscopy, and length of thrombocytopenia. If available, type of thrombosis and other co-risk factors for bleeding complications, such as, use of exogenous estrogen compounds, history of DVT or PE and recent major surgery. Data collection is currently in progress and the analysis of results is pending.

Learning Objectives:

Discuss clinical trials and the National Cancer Comprehensive Network treatment guidelines of VTE in cancer patients.

Understand the risk for bleeding complications in cancer patients during anticoagulation, especially in the unique population of BMT and leukemic patients.

Self Assessment Questions:

What does the NCCN guidelines state as the preferred initial treatment (in hospital) for VTE?
A.IV heparin
B.Warfarin
C.Low-molecular-weight heparins
D.Both A or C

True or False: Platelet transfusions carry a risk for complications, such as infections, alloimmuization, and febrile transfusion reactions.

COMPARISON OF DEXMEDETOMIDINE VERSUS FENTANYL PLUS MIDAZOLAM FOR PERIOPERATIVE SEDATION IN PATIENTS UNDERGOING ISOLATED CORONARY ARTERY BYPASS GRAFT SURGERY

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Objective: Dexmedetomidine is a highly selective alpha2-agonist approved by the FDA in 1999 for short-term (< 24 hours) analgesia and sedation in the intensive care unit. Recently, St. Joseph's Hospital (SJH) in Marshfield, Wisconsin changed the perioperative cardiac surgery sedation protocol from fentanyl plus midazolam to dexmedetomidine as part of a Lean Six Sigma project. This change was made secondary to the proposed benefits of shorter times to extubation with dexmedetomidine as compared to the combination of fentanyl and midazolam. The primary objective of this retrospective review is to evaluate the clinical and economic benefits of the new sedation regimen, dexmedetomidine, versus the previous standard sedation regimen, fentanyl plus midazolam, in isolated coronary artery bypass graft (CABG) surgeries.

Methods: A retrospective review of 203 patients who had isolated CABG surgeries at SJH, a 500-bed teaching hospital, will be conducted. The control group will consist 108 patients who received the previous standard sedation regimen, fentanyl plus midazolam, between January 1st and March 31st of 2004, and the comparison group will consist 95 patients who received the new standard sedation regimen, dexmedetomidine, between January 1st and March 31st of 2006. Inclusion criteria includes all patients > 18 years old who isolated CABG surgeries within the above specified dates. The following data will be collected: patient demographics, time to extubation, rate of re-intubation, number of hours in the intensive care unit, post-operative length of stay, dexmedetomidine, fentanyl and midazolam utilization, major complications as reported to the Society of Thoracic Surgeons (STS) database, mortality, total post-operative charges per patient, and selected STS national averages. A comparison of the above data will be undertaken to assess clinical and economic differences between the sedation regimens.

Results/Conclusion: Data analysis and collection is currently ongoing. The results and conclusion will be presented at the conference.

Learning Objectives:

Discuss the rationale for perioperative use of dexmedetomidine in isolated CABG surgeries

Describe the difference in outcomes between patients receiving perioperative dexmedetomidine or fentanyl plus midazolam in isolated CABG surgeries at SJH

Self Assessment Questions:

The FDA approved maintenance dose for continuous IV infusion of dexmedetomidine is:
a.0.2-0.7 mcg/kg/hr
b.0.2-0.7 mcg/kg/min
c.0.2-0.7 mg/kg/hr
d.0.2-0.7 mg/kg/min
e.2-7 mcg/kg/hr

T/F Dexmedetomidine is an effective sedative without clinically significant respiratory depressive effects, allowing for extubation without discontinuation of the continuous infusion

TAMSULOSIN PRESCRIBING IN A VETERAN POPULATION: A RETROSPECTIVE ANALYSIS

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Purpose:
It's estimated that 90% of men will exhibit some evidence of benign prostatic hypertrophy (BPH) by the time they are 85 years old. At Hines VAMC, the recommended formulary agents for the treatment of BPH are terazosin or prazosin, and tamsulosin is non-formulary. Hines VAMC is currently an outlier in terms of the amount of tamsulosin prescribing in the facility. Due to the difference in cost and because it's anticipated that such a large percentage of the patient population at Hines will be diagnosed with BPH, it becomes important to evaluate the utilization of tamsulosin. The primary purpose of this project is to evaluate drug-prescribing patterns of tamsulosin including whether there is a difference in patient adherence to tamsulosin and terazosin. Evaluation of documentation of symptom improvement, adverse effects, and satisfaction of criteria for use will also be evaluated.

Methods:
A list of veterans with an outpatient prescription for tamsulosin filled between August 1st, 2003 and August 1st, 2006 will be generated and reviewed to determine the percentage of patients with: an indication of BPH, a documented ADE to terazosin, documented symptom improvement with tamsulosin, documented ADE to tamsulosin, and original non-VA use of tamsulosin. Charts will also be reviewed to determine the length of time to follow-up between initiation of terazosin and ADE reported, whether slower re-titration of terazosin or a switch to another alpha 1-antagonist occurred after the ADE to terazosin, whether PBM criteria for tamsulosin use are satisfied, and the length of time to follow-up after initiation of tamsulosin. Refill histories for tamsulosin and terazosin will be evaluated to determine whether adherence patterns differ between the two treatments.

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

Learning Objectives:

Understand the role of tamsulosin in the treatment of BPH.

Identify the non-selective and selective alpha 1-antagonists currently available to treat BPH.

Self Assessment Questions:

True or False: Tamsulosin is used as a "curative" agent to treat BPH.

True or False: Tamsulosin is a selective alpha 1a-antagonist.

"OUCH!" WHAT ARE WE DOING FOR KIDS WITH PAIN FROM SICKLE CELL DISEASE?

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Background: An average of 72,000 people are diagnosed with sickle cell disease (SCD) every year. The hallmark symptom associated with sickle cell disease is pain (acute and chronic). Children can have their first acute pain crisis as early as 6 months of age affecting them throughtout life. There are many analgesics used by practitioners to manage pain related to sickle cell disease, however achieving adequate pain control for these children can be an overwhelming task.

Purpose: To characterize the type, doses, and efficacy of analgesics used in children for pain related to sickle cell disease. Data will be analyzed to identify trends or patterns between the types of analgesics identified and analgesic efficacy. Results will be used to assist in planning programs and protocols to optimize pain management at Children's Hospital of Michigan.

Methods: Retrospective chart review involving the review of analgesics administered and correlating pain scores in children with sickle cell disease. ICD-9 codes in the hospitals medical record database will be used to identify patients admitted with sickle cell pain crisis from January 2006 to December 2006. The list of patients will be reviewed for eligibility. Patients meeting all inclusion criteria will then be given a study number and pertinent data will be documented from the medical chart. Only one patient visit per patient will be included in the study. Data collected will include age, gender, race, weight, admission date, length of hospitalization, type and doses of analgesics prescribed, frequency of administration, number of doses administered, administration times, and pain scores using the Wong Baker pain scale, and physiologic measures of heart rate, respiratory rate, blood pressure, and level of sedation. Differences in analgesic classes and respective doses will be evaluated.

Results/Conclusion: Data collection is currently ongoing. Results and conclusions will be presented at the conference.

Learning Objectives:

To characterize the types and frequency of analgesics administered for pediatric patients admitted with a diagnosis of pain from sickle cell disease in an urban children's hospital.

To determine the efficacy of the most frequently prescribed analgesics using pain scores

Self Assessment Questions:

(True/False) The hallmark symtom associated with sickle cell disease is pain.

Sickle cell disease most commonly affects
a. Caucasians
b. African Americans
c. Hispanics
d. Asians

DETERMINING THE ROLE OF A PHARMACIST IN THE EMERGENCY DEPARTMENT

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Background: The American Society of Health System Pharmacist (ASHP) believes that incorporating pharmacists into the healthcare team of the emergency department (ED) will improve patient safety, medication use outcomes, and decrease medication expenses. The benefit of pharmacy services has been demonstrated in various in-patient and outpatient settings. With approximately half of hospital admissions coming from the ED, participation in patient care from the moment of arrival has been shown to improve patient care, improve patient flow, improve prescriber education and cost awareness, improve patient satisfaction, reduce medication costs, and improve student/resident education.

Purpose: The purpose of this project is to determine the steps required to incorporate pharmacy services in the ED at a large community teaching hospital.

Methods: A survey was distributed to physicians, residents and nurses to determine which pharmacy services they feel would be beneficial to the workflow and quality of patient care in the ED. A one-month pilot study with a pharmacist providing pharmaceutical care will be conducted during March in the acute care module of the ED. The following activities will be documented: completion of medication reconciliation forms, drug information provided, medication recommendations (including initial therapy, dosage adjustments, formulary interchanges, change in dosage formulations, drug interactions, and duplication in therapy), review of medication orders, patient education, participation in cardiac arrest and rapid sequence intubations, and appropriate antibiotic usage according the hospital's pneumonia pathway and the Infectious Disease Society of America (IDSA) guidelines. Medication reconciliation forms completed by the pharmacist during the pilot will be compared for completeness to a random selection of medication reconciliation forms. All pharmacist interventions will be documented and analyzed at the conclusion of the pilot study.

Results/Conclusion: Data collection is in progress. Results and conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:

Discuss current literature describing the various roles and impact of ED pharmacists

Identify potential benefits from pharmacist obtained medication reconciliation at ED presentation

Self Assessment Questions:

List 4 activities that an ED pharmacist may carry out or provide that will have an impact on patient care.

Pharmacists obtaining medication histories may improve patient safety and patient care. T or F

PHARM.D. ENHANCEMENT OF MEDICAL RESIDENT CLINICS; A COLLABORATIVE CARE MODEL TO IMPROVE DIABETES OUTCOMES

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Purpose: Diabetes is a chronic disease that affects nearly 20.8 million (7%) children and adults in the United States and is estimated that one-third of this population does not realize they have the disease. Diabetes places individuals at an increased risk for serious complications including heart disease, stroke, high blood pressure, retinopathy, nephropathy, neuropathy, and amputations. Pharmacists can have a great impact on diabetes care by improving medication adherence, providing patient education, use of appropriate medication and proper titration, and identifying and managing adverse effects. There are many studies that assess diabetes care by medical record review; however, this is the first study that will determine the impact of clinical pharmacists involved in direct patient care in collaboration with medical residents on diabetes care outcomes.

Objective: To determine the impact of clinical pharmacists involved in direct patient care on glycemic control, cardiovascular, and renal parameters in patients with Diabetes Mellitus (DM) type 2 compared to medical resident clinics alone at the Louis Stokes Cleveland Veterans Affairs Medical Center.

Methods: A Retrospective chart review from 7/1/04 to 6/30/05 will be conducted of patients with DM Type 2, identified by ICD-9 code, between the ages of 18-99 years. One hundred patients managed by medical residents will be compared to 100 patients referred by a medical resident to be managed by a PharmD in an outpatient clinic. Patients will be excluded if they were referred by a provider other then a medical resident. Data collection and analysis will include but is not limited to: demographic data; HbA1C, blood pressure, and LDL goal attainment; mean number of blood pressure and diabetes medications; foot and eye examinations for patients with diabetes; aspirin use; and participation in DM self-education and nutrition classes.

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

Learning Objectives:

Describe the current ADA clinical recommendations for the management of Diabetes.

Identify the impact of clinical pharmacists on HbA1C, blood pressure, and LDL goal attainment in this study.

Self Assessment Questions:

What is the recommended blood pressure goal for a patient with Diabetes?

True or False: The risk of death from heart disease and stroke is 2 to 4 times higher in a patient with diabetes then those without the disease.

EVALUATION OF ANGIOTENSIN CONVERTING ENZYME-INHIBITORS' (ACE-I) EFFECT ON CARDIOVASCULAR RISK REDUCTION IN POST-MYOCARDIAL INFARCTION PATIENTS WITH NORMAL VERSUS ELEVATED CHOLESTEROL

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According to ACC/AHA guidelines, treatment with ACE-inhibitors is recommended following a myocardial infarction (MI). Although ACE-inhibitors have been shown to reduce cardiovascular risk in high-risk patients, more recent evidence has raised the question of whether ACE-inhibitors significantly reduce cardiovascular risk in patients with normal or adequately treated hypercholesterolemia. Thus, the primary objective of this study is to compare the effect of ACE inhibitors on cardiovascular risk reduction in post-MI patients with normal versus elevated cholesterol.

A list of patients greater than 18 years of age admitted to Methodist Hospital with an MI between January 1, 2000 and December 31, 2002 was generated. From the list, each randomly selected patient's medical chart was retrospectively reviewed for the occurrence of the primary outcome, hospitalization for a subsequent cardiovascular event during the two years following initial hospitalization for MI. Differences between percentages of patients reaching the primary outcome were compared between the following groups: (1) patients with normal cholesterol who were receiving ACE-inhibitors; (2) patients with eleveated cholesterol who were receiving ACE-inhibitors; (3) patients with normal cholesterol who were not receiving ACE-inhibitors; and (4) patients with elevated cholesterol who were not receiving ACE-inhibitors.

To date, of the 416 charts reviewed, 254 have met inclusion criteria for the analysis. Preliminary results have shown that in patients with normal cholesterol, 44% of patients in the ACE inhibitor-treated group reached the primary outcome versus 47% of the patients in the non-ACE-inhibitor-treated group. Also, in patients with elevated cholesterol, 37% of patients in the ACE inhibitor-treated group reached the primary outcome versus 40% of the patients in the non-ACE-inhibitor-treated group.

Preliminary data suggests a numerical trend favoring the ACE-inhibitor group. Further data collection is ongoing to assess whether a statistically significant difference between treatment groups exists with respect to cardiovascular risk reduction.

Learning Objectives:

Discuss ACE-inhibitors' potential to reduce cardiovascular risk in high risk patients.

Evaluate the potential benefits of ACE-inhibitors for patients with normal versus elevated cholesterol.

Self Assessment Questions:

T/F ACE-I have been shown to reduce cardiovascular risk in all patients.

T/F ACE-I only reduce cardiovascular risk by blocking the activation of the renin-angiotensin-aldosterone system.

OPPORTUNITIES TO SERVE THE UNDERSERVED: A HOSPITAL BASED MEDICATION ASSISTANCE PROGRAM

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Objectives:
Saint Joseph Regional Medical Center (SJRMC) provides 11.5 million dollars of charity care to more than 2000 patients residing in St. Joseph county and the surrounding area each year. One way to better steward our resources is through manufacturer supported medication reimbursement programs.

A proactive outpatient medication assistance program at SJRMC was established in 1987. The success of this program has prompted SJRMC to expand the program to include patients serviced by the inpatient pharmacy department.

The objective of this program is to maximize available manufacturer reimbursement for medications dispensed by the inpatient pharmacy department to qualified individuals.

Methods:
Patients eligible for inclusion in the program were those enrolled in the SJRMC CareCard, as well as uninsured "self-pay" patients. These patients were screened upon admission to the hospital, or any outpatient clinic or infusion center serviced by the inpatient pharmacy department.

Any medication provided to the aforementioned patients with a pharmacy charge greater than two hundred and fifty dollars was screened. Also, any pharmacy charge greater than two thousand dollars was screened.

The pharmacy practice resident evaluated the patient profiles to identify medications that could be reimbursed or replaced through medication assistance programs and completed the necessary paperwork for each program.

Results:
After 98 days, 350 patient days (average 4.4 per day) and 604 medications (average 6.35 per day) were screened, and reimbursement was available for two patients (1 outpatient series, 1 oncology observation). They were seen 9 times, with a total available reimbursement worth $14,323. Both were classified as uninsured "self-pay" patients.

Conclusions:
For hospitals providing similar charity care, we suggest surveying the available medication reimbursement programs provided by your medication suppliers (i.e. McKesson). If this is not possible, consider focusing on a small list of high cost medications provided to outpatient series and oncology patients.

Learning Objectives:

Identify areas of a hospital pharmacy practice in which the maximal benefit of a medication assistance program will be derived.

Discuss complications of both implementing and conducting a pharmacist-coordinated hospital medication assistance program.

Self Assessment Questions:

Focusing on oncology patients is a good strategy for a successful medication assistance program in the hospital setting. T/F

Hospital based medication assistance programs allow institutions to directly save money, while ambulatory programs are focused at preventing cost. T/F

ANALYSIS OF HUMAN EPIDERMAL GROWTH FACTOR RECEPTOR 2 STATUS OF PATIENTS RECEIVING TRASTUZUMAB AT A TERTIARY CARE HOSPITAL

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Background: Trastuzumab is a monoclonal antibody used primarily in the treatment of breast tumors that overexpress the HER2/neu receptor (human epidermal growth factor receptor 2). HER2 testing can determine if a tumor over expresses the HER2 receptor or if the gene which codes for the receptor, HER2/neu, is amplified (multiple copies found in the tumor cells). If the receptor is over expressed or if the gene is amplified, the patient may receive trastuzumab. Borderline HER2 test results require additional testing and in some cases, corroboration with clinical status. The definition of a borderline test result has not been clearly defined and conflicting recommendations have been proposed. Recently, the National Comprehensive Cancer Network (NCCN) published new guidelines describing appropriate HER2 testing and interpretation of the results to identify appropriate candidates for trastuzumab.

Purpose: To determine the HER2 status of all patients receiving trastuzumab and compare them to current HER2 testing guidelines.

Methods: Patients receiving trastuzumab between July 1, 2005 and June 30, 2006 within The Ohio State University Medical Center (OSUMC) and James Cancer Hospital (JCH) are included in the study population. A retrospective review of the OSUMC electronic laboratory database (eResults) will be used to determine if HER2 tumor status was determined using immunohistochemistry (IHC), fluorescence in situ hybridization (FISH), or both. For patients whose HER2 status cannot be determined using eResults, the patient's medical record will be reviewed in greater detail. Patients with borderline HER2 test results will be further evaluated to determine if NCCN guidelines and OSUMC Medication Use Evaluation (MUE) guidelines are being adhered to.

Learning Objectives:

Identify the different methods for testing HER2 tumor status and how to interpret the results.

Identify the appropriate HER2 status(s) that subsequently indicate treatment with trastuzumab.

Self Assessment Questions:

True or False: An IHC result of 3+ indicates a borderline level of HER2/neu receptor expression and FISH testing should be performed to determine HER2/neu tumor expression.

True or False: IHC testing should always be done initially and FISH testing should only be performed in the event of a borderline IHC result.

ADVERSE SEROTONERGIC EFFECTS OBSERVED IN PATIENTS RECEIVING CONCOMITANT LINEZOLID AND SEROTONIN RE-UPTAKE INHIBITORS

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PURPOSE: Linezolid is an oxazolidinone antibiotic that is also a reversible non-selective inhibitor of monoamine oxidase (MAO). When combined with agents that inhibit serotonin reuptake, it has the potential to cause serotonin excess and serotonin syndrome. The purpose of this study is to determine if the concomitant use of linezolid and one or more SRIs is associated with an increase in adverse effects that are consistent with serotonin excess.

METHODOLOGY: This is a retrospective, case-controlled study. Patients who received linezolid and one or more SRI for at least 24 hours during an inpatient stay at the University of Michigan Medical Center between January 1, 2000 and December 31, 2005 will be identified via electronic databases. Cases will be matched to control patients who received one or more SRI and another antibiotic of similar spectrum of activity for a similar infection over the same time period. The groups will also be matched with respect to demographic factors such as age (by decade), gender, hospital service (medical vs. surgical), as well as which SRI(s) the patients were receiving. Patients will be evaluated for at least 7 days after discontinuation of one of the medications (either the SRIs, or linezolid (study group) or any other antibiotic(s) (control group)). All components of the medical record will be reviewed to evaluate for the presence or documentation of symptoms consistent with serotonin excess, serotonin syndrome, and other relevant data.

RESULTS/CONCLUSIONS: Data collection in progress; conclusions will be drawn based on the analysis of the data. The results of this study may add to our understanding of this drug interaction, describe the potential risk and severity of adverse effects associated with the interaction, and help clinicians evaluate this drug interaction to determine how to best treat patients who require treatment with both linezolid and one or more SRIs.

Learning Objectives:

1. Describe the mechanism of the interaction between linezolid and serotonin reuptake inhibitors.

2. Recognize the signs and symptoms of serotonergic excess and serotonin syndrome.

Self Assessment Questions:

True or False: Linezolid contributes to symptoms of serotonergic excess by enhancing the pre-synaptic synthesis of serotonin from chemical precursors.

True or False: The most frequent clinical features of serotonin excess and serotonin syndrome are changes in mental status, restlessness, myoclonus, hyperreflexia, diaphoresis, shivering and tremor.

IMPLEMENTATION OF PYXIS CONNECT TECHNOLOGY WITHIN A MULTI-HOSPITAL HEALTH CARE SYSTEM

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Objective: Current practice within most health care facilities is for the pharmacist to receive medication orders on paper. This process involves routing the order by delivering, faxing, or utilizing a pneumatic tube system to accomplish this task. A pharmacist located in specific receiving locations throughout the hospital views and process the medication orders.

Pyxis Connect technology allows physician orders to be electronically sent to pharmacy through digital scanners. The electronic image is immediately available at any pharmacy workstation within the health care system. Potential advantages of the Pyxis Connect technology are improved turnaround time, reduction of lost orders, reduced transcription errors, and improved patient safety and patient satisfaction through faster order processing. The objective of this project is implement Pyxis Connect technology within a multi-hospital Health Care System and measure the impact on the outcomes listed.

Methodology: The first step will be to complete an assessment of the equipment requirements at each of the facilities within the health care system. The implementation of Pyxis Connect will affect some of the current processes, which include stat orders, illegible digital images, equipment malfunctions, and a downtime procedure. Therefore, all of the pharmacists, nurses, and health unit coordinators (HUCs) at each of the facilities will need to be educated about the new technology and its implications. Informational group sessions, educational posters, and hands-on training will accomplish the educational portion of the implementation. Prior to the Pyxis Connect implementation, a pilot will be done on one intensive care unit and four general medical floors. The goal of the pilot is to assess workflow issues (pharmacists, nurses, and HUCs) and software capabilities. The final step will be to implement Pyxis Connect at each of the hospitals within the health care system.

Learning Objectives:

Understand digital scanning technology related to the practice of pharmacy

List three advantages of the Pyxis Connect technology

Self Assessment Questions:

(T/F) Pyxis Connect technology has been shown to reduce the number of lost orders and the number of transcription errors?

(T/F) Pharmacy turnaround time is greatly increased due to digital scanning technology?

EFFECT OF INAPPROPRIATE EMPIRIC ANTIBIOTIC THERAPY ON PATIENT MORBIDITY IN THE TREATMENT OF CRITICALLY ILL PATIENTS WITH PNEUMONIA OR BACTEREMIA

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Purpose:
In critically ill patients, inappropriate empiric antibiotic treatment (IEAT) for bacteremia and pneumonia has been associated with increased mortality. However, the effect of IEAT on patient morbidity has not been extensively studied. The purpose of this study was to determine the effects of IEAT on patient morbidity outcomes.

Methods:
A retrospective chart review of 244 patients with ICU-related bacteremia or pneumonia was performed. The primary objective was to compare the total number of dysfunctional organ systems in patients receiving appropriate versus IEAT. Secondary analysis included the effect of IEAT on individual organ dysfunction, ICU and hospital stay, and resource utilization.

Results:
IEAT occurred in 37% of patients and was due to inactive antibiotics against methicillin resistant Staphylococcus aureus, Enterococcus sp., and multi-drug resistant Gram-negative organisms (n=51) or lack of empiric antibiotic treatment (n=40). The number of dysfunctional organs was larger in IEAT pneumonia patients versus appropriate patients (3.0 vs. 2.0, respectively, p=0.023), but not in bacteremic patients or in all patients. There were no differences in individual organ dysfunction. More IEAT patients required insulin drips (32.9% vs. 17.6%, p=0.01) and insulin infusion duration was 5.5 and 2.0 days, in the inappropriate and appropriate groups, respectively (p=0.011). Mechanical ventilation duration was 5 and 15 days in appropriate and IEAT patients, respectively (p<0.001), however post-infection duration was similar (5 vs. 6 days, respectively, p=0.306). Post-infection mechanical ventilation duration in patients with APACHE II >20 was longer in the inappropriate versus appropriate group (7 vs. 4 days, p=0.013). The IEAT group demonstrated longer total hospital (24 vs. 15 days, p<0.001), total ICU (15 vs. 7 days, p<0.001), and post-infection ICU stay (7 vs. 5 days, p=0.014).

Conclusion:
IEAT is associated with greater organ dysfunction in pneumonia patients and increased resource utilization. Empiric antibiotic therapy targeting multi-drug resistant bacteria may prevent detrimental patient outcomes.

Learning Objectives:

To describe the data currently published regarding morbidity related to inappropriate antibiotic therapy.

To examine the clinical outcomes of organ dysfunction, resource utilization, and cost associated with inappropriate antibiotic therapy in critically ill patients.

Self Assessment Questions:

Clinical trials have shown up to a 16.5 fold increased risk of death if patients receive inappropriate antibiotic therapy. T/F

To date, clinical trials have shown IEAT has detrimental effects on
a.Duration of mechanical ventilation
b.Length of ICU stay
c.Organ system function
d.All of the above

RISK FACTORS ASSOCIATED WITH THE DEVELOPMENT OF CLOSTRIDIUM DIFFICILE-ASSOCIATED DIARRHEA IN A COMMUNITY HOSPITAL SETTING

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Background: Clostridium difficile is currently the leading cause of nosocomial-associated diarrhea in the U.S. The development of C. difficile-associated diarrhea (CDAD) has been associated with the following risk factors: antibiotic use, age, ICU admission, multiple or severe underlying disease, prolonged hospital stay, recent surgery, altered immune function, anti-acid therapy, nursing home residency, and roommate of hospitalized patient with C. difficile.

Purpose: To determine the risk factors associated with the development of nosocomial-acquired CDAD in a community hospital setting

Methods: A retrospective non-interventional case-control study was conducted on patients with CDAD that were admitted to Community Health Network in Indianapolis, IN, in 2006. Patients were included if they were between 18 and 89 years of age and if they were diagnosed, by the infection control nursing staff, with nosocomial-acquired CDAD by meeting the following criteria: documented diarrhea, positive assay for C. difficile toxin or other positive diagnostic methods, and overnight hospital stay within 3 months of positive assay. Two control patients were matched to each case patient with respect to date of admission within 1 week of C. difficile positive assay and age within 10 years. The primary objective was to determine which risk factors have an independent association with the development of CDAD. The following risk factors were evaluated via review of the electronic inpatient database using a logistic regression analysis: previous antibiotic exposure, nosocomial exposure, use of anti-acid therapy, recent abdominal surgery, recent physician contact with the patient, and recent chemotherapy or immunosuppressive therapy.

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

Learning Objectives:

Identify modifiable risk factors associated with an increased risk of CDAD.

Recommend therapeutic interventions in accordance with current national practice guidelines to decrease patient exposure to modifiable risk factors.

Self Assessment Questions:

T/F Both histamine receptor blockers and proton pump inhibitors have been found to be independent risk factors of CDAD.

T/F C. difficile infections are always associated with antimicrobial therapy.

INCIDENCE OF OPIOID POLYPHARMACY IN AN INPATIENT SETTING

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Background: Polypharmacy, in general, has been given numerous definitions, including the use of too many medications, overlapping therapy to treat the same disease, and using a medication to treat the side effects of another medication. Although the term opioid polypharmacy has not been previously defined, it can have many deleterious effects. Patients receiving multiple opioids may be at increased risk for side effects and potentially may have sub-optimal pain control. Opioid polypharmacy may also lead to medication errors including under or overdosing a patient, confusion on behalf of the patient or care giver as to which pain medication should be used when, and filling and dispensing errors.

Purpose: To determine the incidence of opioid polypharmacy in an inpatient setting. Secondary outcomes include: incidence of acetaminophen polypharmacy and to determine knowledge and attitudes of nurses, physicians, and pharmacists towards opioid polypharmacy.

Methods: Opioid polypharmacy was defined as > 2 opioid-containing products on an as needed basis for acute pain or = 2 opioid-containing products in chronic pain with the exception of a long-acting opioid combined with an immediate-release opioid for breakthrough pain. A retrospective computer generated opioid report was analyzed over a one-month period. Surveys were distributed at various health-system events to nurses, physicians, and pharmacists.

Results: Total number of patients evaluated was N=1519. The incidence of opioid polypharmacy was 26% (N=391). Total number of patients with = 2 opioids (N=980) and of these the total number of patients with = 2 acetaminophen products ordered concurrently was 49% (N=481). The survey is ongoing.

Conclusions: The incidence of opioid polypharmacy at Sparrow Health System is significant at 26 % (N=391 patients) in one-month time period. To our knowledge this represents a significant incidence not formally described elsewhere. Potential implications of opioid polypharmacy can be divided into patient safety and patient satisfaction.

Learning Objectives:

To define opioid polypharmacy.

To evaluate a patient profile for the presence of opioid polypharmacy.

Self Assessment Questions:

T or F Opioid polypharmacy is well defined in the available literature.

T or F An example of an appropriate pain regimen for CHRONIC pain would be fentanyl patch Q 72 hours scheduled, PO morphine sustained release Q 12 hours scheduled, and PO morphine immediate release prn for breakthrough pain.

DEVELOPING AND IMPLEMENTING A PLAN FOR IMPROVING TURNAROUND TIME OF CRITICAL MEDICATIONS

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Purpose:
Pneumonia remains an important cause of morbidity and mortality despite advances in care. Guidelines recommend prompt administration of antibiotics in the setting of suspected pneumonia because even appropriate, but delayed, therapy has been shown to be detrimental to patient outcomes. Surviving Sepsis Campaign guidelines recommend administration of antibiotics within the first hour of recognizing sepsis, which has been shown to reduce mortality in patients. The Institute for Healthcare Improvement also stresses the importance of timely administration of antibiotics in sepsis and aims to reduce sepsis mortality 25% by the year 2009. The primary objective of this study is to identify opportunities for reducing the time from medication order writing to administration (turnaround time) at a large tertiary-care teaching hospital and develop interventions to improve turnaround time for first dose antibiotics and patient outcomes when treating sepsis or healthcare-acquired pneumonia (HCAP).

Methods:
Systems-based changes to the medication administration processes will be made to reduce turnaround time of first dose antibiotics. Cefepime and vancomycin are the pilot medications for the study. The changes to be made include: education of the resident physicians and nurses, implementation of a sepsis phone and order set, use of a yellow stat label printer for first dose antibiotics, and stocking Add-vantage piggybacks of cefepime and vancomycin in the Pyxis cabinet on one medical critical care unit to be used for the first dose. Cefepime and vancomycin antibiotic orders will be identified through the pharmacy database. Orders for patients in the medical and surgical critical care units will be randomly chosen for evaluation in a baseline and post-implementation time-motion study to evaluate turnaround time and other pre-specified time points in the medication administration process. Secondary outcomes will be evaluated by ICD-9 codes for HCAP or sepsis.

Results:
Results and conclusions will be presented at the residency conference.

Learning Objectives:

Describe the purpose and benefit of reducing antibiotic turnaround time in specific disease states.

Identify potential systems-based changes for antibiotic administration and strategies for improving turnaround time.

Self Assessment Questions:

True or False. Despite appropriate antibiotic therapy in pneumonia, delaying the initiation of antibiotics has been shown to have a negative effect on patient outcomes.

True or False. Antibiotics should be administered to a septic patient within 2 hours of recognizing symptoms.

RETROSPECTIVE COMPARISON OF LINEZOLID VERSUS DAPTOMYCIN FOR THE TREATMENT OF VANCOMYCIN-RESISTANT ENTEROCOCCUS (VRE) BACTEREMIA IN NEUTROPENIC PATIENTS

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Purpose: Neutropenia is a side effect incurred by many patients who undergo chemotherapy due to the myelosuppressive nature of chemotherapeutic regimens. When neutrophil counts begin to decline, the risk of infection increases dramatically. Vancomycin has historically been effective for treating gram-positive infections in neutropenic patients. In the past several years there has been an increase in the rate of vancomycin-resistant enterococcus (VRE) seen in patients with neutropenia. Both linezolid and daptomycin are antibiotics that have shown promise in the treatment of VRE bacteremia. The objective of this study is to evaluate the efficacy and safety of linezolid versus daptomycin for the treatment of VRE in neutropenic patients.

Methodology: This retrospective chart review was approved by the institutional IRB in November 2006 and will include adult inpatients on the hematology/oncology and blood and marrow transplant services at the University of Michigan Health System. Patients who are greater than 18 years of age with a documented VRE bloodstream infection and an absolute neutrophil count less than 1000 cells/mm3 and who received either linezolid or daptomycin will be included in the study. Efficacy endpoints include time to clinical and microbiological eradication of the organism and duration of time to deffervescence. Safety endpoints to be analyzed include creatine phosphokinase, renal and hepatic function, and complete blood and platelet counts, including duration of neutropenia. Other data will be collected to determine the baseline characteristics of the study population. Demographic data will be compared between the two groups using descriptive statistics with chi-square, Fisher's exact and student t-tests as appropriate. Results will be used to determine safety and efficacy of these two drugs for the treatment of VRE in the neutropenic population.

Learning Objectives:

Understand some limitations in treating patients who are infected with resistant organisms such as vancomycin-resistant enterococcus (VRE)

Describe factors that may lead to poorer outcomes in neutropenic patients treated for VRE

Self Assessment Questions:

True or False: Thrombocytopenia has been shown to be associated with long-term treatment with linezolid

True or False: Both linezolid and daptomycin are bactericidal against VRE

INDOMETHACIN VERSUS IBUPROFEN FOR CLOSURE OF PATENT DUCTUS ARTERIOSUS: A RETROSPECTIVE EVALUATION OF EFFICACY AND SAFETY

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Purpose: Patent ductus arteriosus is a significant health problem facing premature infants. Indomethacin is the usual treatment for closure of patent ductus arteriosus in premature infants. However, its use is associated with a variety of side effects. The purpose of this study is to compare ibuprofen and indomethacin with regard to efficacy and safety for the treatment of patent ductus arteriosus in the premature infant population.

Methods: Patients were identified through pharmacy dispensing records of both intravenous indomethacin and ibuprofen, with an echocardiogram report confirming the presence of patent ductus arteriosus. Initially, 30 patients were identified for the indomethacin group (0.2 mg/kg every 12 hours for 3 doses); next, patients receiving ibuprofen were matched with the indomethacin patients to form the ibuprofen group (initial dose of 10 mg/kg, with two additional doses of 5 mg/kg given at 24 and 48 hours). The rate of ductal closure, the need for additional treatment, side effects, complications, and the infants' clinical course were recorded.

Results/conclusions: Ductal closure occurred in 21 of 30 infants given indomethacin (70%). A second course of indomethacin closed the patent ductus arteriosus in 10 of 30 infants (33%). Surgical ligation was required in 8 of 30 infants (27%). The ibuprofen group is being accrued and prepared for data analysis. Further results and conclusions will be presented at the Great Lakes conference.

Learning Objectives:

Describe the mechanism by which indomethacin and ibuprofen mediate closure of patent ductus arteriosus.

List several complications associated with indomethacin use in the neonatal population.

Self Assessment Questions:

What percentage of patients requires surgical intervention for closure of the patent ductus arteriosus following therapy with either indomethacin or ibuprofen?

T/F Ibuprofen and Indomethacin have identical side effect profiles.

QUALITATIVE ANALYSIS OF THE SUSPENSION THAT RESULTS FROM MIXING INSULIN GLARGINE AND INSULIN LISPRO

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BACKGROUND: Two articles have been published recently that examine the effects of mixing long acting insulin glargine and rapid-acting insulin lispro or insulin aspart prior to administration in pediatric patients. Mixing these insulins prior to administration minimizes the number of daily injections required, though mixing insulin glargine with any other insulin is not recommended by the manufacturer. The investigators noted that when these insulins were mixed, a cloudy suspension resulted. To the best of our knowledge the chemical and physical properties of these insulin suspensions have not been characterized.
Studies that have examined insulin degradation demonstrate that insulin degrades more rapidly in an acidic environment than in a neutral environment. One of the degradation products is a result of a deamidation reaction that occurs at position 21 of the A chain of insulin. The other major degradation product that forms in an acidic environment is a covalent insulin dimer. Although insulin glargine is structurally protected from this type of degradation by strategic amino acid substitution, rapid-acting insulin analogs (RAIs) are not. Thus, when mixing an RAI with insulin glargine (which is formulated in an acidic environment), the RAI would theoretically be more susceptible to degradation reactions.
PURPOSE: To better understand the precipitation reaction that occurs when an RAI and insulin glargine are mixed.
METHODS: The reversibility of the precipitation reaction that occurs when mixing insulin glargine with insulin lispro will be examined. After mixing insulin glargine and lispro at a concentration of 2:1 respectively, the liquid component will be separated from the solids that are formed via filtration. The liquid portion will be centrifuged using centrifugal filtration devices immediately after mixing the insulins and at 30 days after mixing the insulins. Qualitative analysis of the resulting filtrate via gel electrophoresis will identify whether byproducts are present.
RESULTS/CONCLUSION: Pending.

Learning Objectives:

Identify a potential benefit for mixing insulin glargine and a rapid-acting insulin analog prior to administration.

Describe the theoretical instability that occurs when mixing insulin glargine and a rapid-acting insulin analog.

Self Assessment Questions:

Which of the following is a benefit of mixing insulin glargine and a rapid-acting insulin analog?
a. Prolonged duration of action of the rapid-acting insulin analog
b. Prolonged duration of action of insulin glargine
c. Superior hemoglobin A1C values as compared to patient administering separate injections
d. Reduced number of daily injections for the patient

True or False: The theoretical instability of mixing insulin glargine and a rapid-acting insulin analog is that the rapid-acting insulin analog is more susceptible to degradation in an acidic environment.
a. True
b. False

INCREASED INCIDENCE OF EARLY AND LATE CYTOMEGALOVIRUS INFECTION IN KIDNEY TRANSPLANTATION RECIPIENTS

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Purpose: The incidence of cytomegalovirus (CMV) infection in the year following kidney transplantation was evaluated retrospectively to determine whether an extension of prophylaxis to 6 months and to include CMV seropositive recipients (R+) is warranted.

Methods: The CMV serostatus of 617 recipient/donor pairs and the results of assays for CMV infection were recorded. The institutional protocol called for 3 months of prophylaxis for CMV seronegative recipients with a seropositive donor (D+/R-). CMV infection was defined as any positive result of a non-quantitative assay or >1500 copies per ml for quantitative PCR. Assays were performed at the discretion of the clinician.

Results: The median time to CMV infection in R+ recipients was 1.8 months in 2003-2004 and 2.3 months in 2005-2006. The median time to infection in D+/R- recipients was 1.9 months during 1999-2002, 3.7 months in 2003-2004 and 3.9 months in 2005-2006. During 2005-2006 the mean time to infection was 4.2 months (p=0.01 for 2005-2006 vs. 1999-2002). Valganciclovir replaced acyclovir as first-line prophylaxis as of 2003.

As of October 27, 2006, CMV infection had developed during the first year post-transplant in 31% of D+/R- recipients from 1999-2005 and in 27% of D+/R- recipients from 2006. CMV infection developed during the first year in 2.3% of R+ recipients from 1999-2003, in 3.8% from 2004, in 4.3% from 2005 and in 14.1% from 2006 (p=0.0391 for 2006 vs. 2005).

Conclusions: The incidence of late CMV infection (>100 days post-transplant) in D+/R- recipients has increased, suggesting that extension of prophylaxis from 3 to 6 months may be warranted. The incidence of early CMV infection has recently increased in R+ recipients. Instituting prophylactic therapy in R+ recipients would now appear to be reasonable. This study will continue to evaluate risk factors for CMV infection in these recipients, including the use of more powerful immunosuppression.

Learning Objectives:

Describe the risk factors for and natural history of cytomegalovirus infection in kidney transplantation recipients.

Compare the effectiveness of various regimens used for prophylaxis against cytomegalovirus infection in kidney transplantation recipients.

Self Assessment Questions:

Which type of kidney transplantation recipient is at highest risk for cytomegalovirus infection?
a.CMV seropositive recipient with a seropositive donor
b.CMV seronegative recipient with a seronegative donor
c.CMV seronegative recipient with a seropositive donor

Which of the following medication regimens is most effective at preventing cytomegalovirus infection in the first 3 months after kidney transplantation?
a.Valganciclovir 900 mg daily
b.Acyclovir 200 mg three times each day
c.Acyclovir 800 mg four times each day

ERYTHROPOIETIN FOR ANEMIA OF PREMATURITY AND THE RISK OF SEVERE RETINOPATHY OF PREMATURITY IN EXTREMELY LOW BIRTH WEIGHT INFANTS

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Purpose: Extremely low birth weight (ELBW) infants (< 1000 grams) are at risk for development of anemia of prematurity (AOP). Strategies to reduce the incidence of AOP include conservative phlebotomy practices and administration of recombinant human erythropoietin (rHuEPO). The majority of studies examining rHuEPO use have found it to have few, if any, adverse effects. A Cochrane database review of late erythropoietin (started after the first week of life) found no correlation with rHuEPO use and any adverse outcomes. However, a Cochrane database review of early erythropoietin (started during the first week of life) found a significant increase in the rate of stage 3 or greater retinopathy of prematurity (ROP). One purpose of this study is to determine if there is an increased incidence of severe ROP in infants that received rHuEPO at an academic medical center. The other primary outcome of this study is to examine the effect that rHuEPO has on the number of blood transfusions required by ELBW infants.

Methods: Approval for exempt status has been obtained from the Investigational Review Board. This retrospective chart review will analyze ELBW infants admitted to The Ohio State University Medical Center's neonatal intensive care unit (NICU) between January 1999 and September 2006. The treatment group includes infants who received rHuEPO. Matched infants who did not receive rHuEPO will be placed in the control group. Results of each patient's ophthalmology exam, grade of retinopathy, and number of transfusions received will be documented. Statistical analysis will be performed using Fisher's exact test to compare the incidence of severe ROP (grade 3-4) and number of transfusions received between the two groups.

Results/Conclusions: Data collection is in process. Results and conclusions of the study will be presented at the conference.

Learning Objectives:

Determine the incidence of severe retinopathy of prematurity in infants who did and did not receive rHuEPO.

Quantify the difference in number of transfusions required between infants who were not administered rHuEPO and those who did.

Self Assessment Questions:

What strategies are employed to reduce the incidence of anemia of prematurity?

Early administration of rHuEPO is defined as administering the medication within the first month of life. T F

CLINICAL OUTCOMES OF ANTIFUNGAL TREATMENT FOR CANDIDEMIA

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Purpose: The two primary objectives of this study are to: determine what antifungal agents are used to treat candidemia and evaluate the clinical outcomes associated with different treatment regimens. The secondary objectives are to determine cost and compliance with Infectious Disease Society Association (IDSA) candidemia guidelines.

Methods: A retrospective chart review will evaluate patients with positive fungal blood cultures admitted to our institution from April 2001 to December 2006. Patients less than 18 years old will be excluded from the study. Data collection will include baseline patient demographics, candida culture, treatment duration, risk factors for candidemia, and length of stay. Patients will be evaluated at the end of treatment for clinical success, clinical relapse, or clinical failure. Data analysis will include a comparison of treatment to IDSA guidelines and a cost analysis on length of stay.

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

Learning Objectives:

Discuss the current treatment options for candidemia.

Evaluate risk factors within patients for developing candidemia.

Self Assessment Questions:

According to the 2004 IDSA treatment guidelines for candidemia, which of the following is an appropriate initial antifungal for treatment of candidemia in a non-neutropenic adult?
a. Fluconazole 400mg-800mg I.V. daily
b. Amphotericin B 0.6-0.7mg/kg I.V. daily
c. Caspofungin 70mg I.V. daily
d. Micafungin 150mg I.V. daily

Risk factors for candidemia include:
a.Prolonged broad-spectrum antibiotic use
b.Total parenteral nutrition
c.Neutropenia
d.All of the above

EVALUATION OF AMIODARONE MONITORING BEFORE AND AFTER A COMPUTERIZED INTERVENTION

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Purpose: Amiodarone use is associated with adverse pulmonary, thyroid, hepatic, cardiac and ocular effects. Life threatening adverse reactions such as pulmonary fibrosis, hepatitis, and additional arrhythmias can occur. Guidelines from the North American Society for Pacing and Electrophysiology (NASPE) and VA Pharmacy Benefit Manager (PBM) give specific recommendations to screen for the possible adverse effects. Previous evaluations of amiodarone monitoring at the Cleveland VA Medical Center (CVAMC) demonstrated low adherence to the recommended monitoring.

A computerized intervention was implemented in December 2006 at the CVAMC to improve amiodarone monitoring through use of an order template. This template displays a list of the recommended laboratory tests and procedures and provides an expedient method of ordering the monitoring parameters.

This study aims to evaluate the efficacy of the intervention to improve adherence to amiodarone monitoring standards, while establishing the current level of adherance and identifying the role of patient completion of ordered tests in non compliance.

Methods: This study will compare two chart reviews, one performed on data from before the intervention, and a second review to be performed one year following implementation of the intervention. Monitoring parameters were deteremined by the cardiology service, based on recommendations by NASPE and the VA PBM. Patients on continuous amiodarone therapy for at least one year were identified, and one hundred charts were selected. Data collected includes demographic information, prescription records, laboratory data, procedure records and documentation of monitoring from progress notes. Data from the initial review will be analyzed using descriptive statistics.

Results and conclusions: A description of the current level of adherence to amiodarone monitoring guidelines and degree of non compliance attributable to patient non adherence will be presented at the Great Lakes Pharmacy Residency Conference. Further analysis will be completed following the second chart review scheduled for 2008.

Learning Objectives:

Review appropriate monitoring parameters to screen for amiodarone toxicities

Identify practical barriers to consistent amiodarone monitoring

Self Assessment Questions:

List 5 monitoring parameters for amiodarone therapy

Thyroid function is rarely abnormal in patients on amiodarone therapy. T/F

THE IMPACT OF ELECTRONIC MEDICAL RECORDS ON PHARMACY PRACTICE IN A PEDIATRIC HOSPITAL

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Background:
The electronic medical record (EMR) is a medical record in digital format. This innovative technology facilitates accessible, comprehensive, and continuous patient care. EMR compiles patient specific information relating to medical and non-medical care, assisting health care professionals in providing optimal care and the safest environment possible. Implementation of EMR forces numerous changes in the practice habits for all personnel, but promises advances with enhanced readability, availability, and data quality. Recently, EMR has gained approval as a valuable tool and has become part of recommended standards in many professional organizations and federal agencies. EMR has been proposed as a method to reduce practice variation and improve quality by increasing efficiency of documentation, prompting of clinicians for alerts, decision support, presentation of data, and access to educational materials for patients.

Purpose:
The present study will determine how implementation of an EMR system impacts pharmacy practice and quality of care in a pediatric hospital.

Methodology:
This comparative study is designed to assess pre- and post-EMR procedures and pharmacy practice information. Pre-EMR data will be obtained from pharmacy records and databases from 2006. Post-EMR data will be collected from the EMR system database and computer medication requests during the first quarter of 2007. An analysis will be performed to determine changes in missing medication requests, medication variances and adverse drug event reports from the hospital quality database, and order entry to delivery times. Data analysis will be performed using a student's t-test. This study has been approved by the Institutional Review Board.

Results / Conclusions:
Data collection is in progress. Results will be used to address the benefits and limitations of use with the new EMR system. Conclusions will be presented at the Great Lakes Pharmacy Resident conference.

Learning Objectives:

Define electronic medical record.

Identify two benefits of an electronic medical record versus a paper chart system.

Self Assessment Questions:

Electronic medical records facilitate patient care because they are:
A. Accessible
B. Comprehensive
C. Continuous
D. All of the above

Electronic medical records have become part of recommended standards in many professional organizations and federal agencies. T or F

EVALUATION OF SERUM BIOMARKERS DURING ULTRAFILTRATION FOR ACUTE DECOMPENSATED HEART FAILURE

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Purpose: The objective of this study is to determine if changes in serum biomarkers can be identified as monitoring parameters/end-points of therapy with ultrafiltration (UF) for acute decompensated heart failure (ADHF).

Methods: A retrospective chart review is being conducted in patients who received UF for the treatment of ADHF from August 1, 2004 through July 31, 2006. Patients greater than 18 years of age who received UF while admitted to cardiology services will be included. Collected data will include: age, weight, height, gender, past medical history, length of stay, time from admission to initiation of UF therapy, etiology of HF, functional class and stage, ejection fraction, and concomitant in-hospital medications. Determination of appropriate monitoring parameters and end-points of therapy will be investigated: specifically, changes in serum creatinine, serum osmolarity, hemoglobin, hematocrit, BUN, sodium, volume, and weight reduction. Data will be analyzed using descriptive statistics

Results/Conclusions: A total of 115 patients have been identified as receiving UF therapy through July 31, 2006. Patients will be divided into two groups based on the duration of UF. Data collection is currently in process. Upon final analysis, the change in serum biomarkers will be compared between the two groups.

Learning Objectives:

Identify patients that are appropriate candidates for UF therapy.

Identify potential benefits of UF over conventional therapy.

Self Assessment Questions:

Maintenance diuretic requirements are not reduced after UF therapy. T/F

Potential benefits of UF over conventional diuretic therapy include: decreased neurohormonal activity, adjustable rate of volume removal, and minimal effects on serum electrolytes. T/F

CLINICAL USE OF THE MODIFICATION OF DIET IN RENAL DISEASE (MDRD) EQUATION IN DOSING OF ANTIMICROBIALS

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Background
Although both the Cockcroft-Gault (CG) and Modification of Diet in Renal Disease (MDRD) equations can be used to estimate a patient's renal function and dictate antibiotic dosing, recent literature suggests that the MDRD formula may provide a much tighter and appropriate estimate of a patient's clearance.

Purpose
The present study will determine whether there exists a statistically significant difference in total daily antibiotic dosing administered to inpatients when calculating the dose using CG versus the MDRD formula.

Methodology
This is a blinded retrospective analysis of inpatients admitted to the University of Illinois Medical Center at Chicago during 2/6/05-8/6/06. Patients will be screened electronically via computerized database query and chosen if they had a documented CrCl or eGFR <60mL/min during their hospital stay. Patients <18 years or undergoing dialysis will be excluded. Investigators will apply standard pharmacokinetic principles to determine estimated GFR using the 4-variable MDRD and CG equations, compare the result to the electronically calculated CG clearance used during the inpatient stay and then subsequently analyze for statistical significance in dosing and cost.

Results
An initial pilot including 29 patients who received 66 antibiotic orders within 24 hours of a serum creatinine illustrated a 23% increase in dose when comparing the CG versus MDRD formula. Consequently, this led to a 45% increase in cost. A total of 195 antibiotic orders need to be included to elucidate statistical power. The most encountered medication in this sample was levofloxacin with a total of 24 orders. Using the CG equation, the average dose was 312.5mg +/- 142.8mg/day. In contrast, employing the MDRD formula resulted in an average dosing of 406.2 +/- 139.1mg/day (P=0.0255).

Conclusion
The initial pilot study showed trend toward increased antibiotic dosing and cost. It appears the most difference in dosing arises for drugs with CrCL adjustments around 40-50 mL/min.

Learning Objectives:

Describe the role and differences between the traditional Cockcroft-Gault equation and the Modification of Diet in Renal Disease (MDRD) formula in estimating renal function.

Determine whether there exists a statistically significant difference in antibiotic dosing and costs when calculating doses using the CG versus MDRD formula.

Self Assessment Questions:

What variables are used in the Cockcroft-Gault equation and the Modification of Diet in Renal Disease (MDRD) formula?

What role does the MDRD formula play in the dosing of antibiotics as it relates to total daily dosing and cost?

THE IMPACT OF AN EDUCATIONAL PROGRAM ON PHARMACISTS' BEHAVIORS IN SMOKING CESSATION

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Objective: To assess the impact of an educational program on pharmacists' behaviors in smoking cessation.
Methods: All pharmacists employed with the grocery store chain pharmacy will be invited to attend an educational program on smoking cessation. Attendees will be given the option of participating in the research and completing a pre-education survey which will assess their knowledge, confidence, and perceived barriers to providing education on smoking cessation to their patients. The anonymous surveys will also focus on the pharmacists' confidence in product selection and counseling patients on appropriate use of products related to smoking cessation. Behaviors of the pharmacists prior to the educational session will be evaluated, including assessment of their interventions on smoking related interactions prior to dispensing prescription medications or recommending OTC products. The preceding educational program on smoking cessation will review: behavioral modifications, pharmacological options, and follow up strategies. Three weeks after the educational session, the participating pharmacists will be asked to fill out a post-survey. The post-survey will give them an opportunity to reflect on the educational session and determine if they feel more confident in: overcoming perceived barriers, counseling patients on products related to smoking cessation, and identifying potential smoking-related prescription or OTC drug interactions
Results: Responses to the surveys will be analyzed to see if the educational session positively impacted the pharmacists' behaviors. The surveys will aid in evaluating if pharmacists incorporated learned strategies, such as obtaining patients' smoking status prior to filling their prescriptions, and if future educational sessions would result in a higher quit smoking success rate. A qualitative analysis will be performed and summarized using summary statistics and comparing the mean and median scores before and after intervention.
Conclusion: It is anticipated that upon conclusion of the study pharmacists will be more confident and knowledgeable when educating patients about smoking cessation.

Learning Objectives:

Identify factors that pharmacists perceive as barriers to performing smoking cessation services.

Determine if a pharmacist education program on smoking cessation will positively impact the pharmacists' behaviors when interacting with and counseling those who smoke.

Self Assessment Questions:

Appropriate education provided by a pharmacists regarding smoking cessation may help reduce:
a. Drug or OTC related interactions
b. Tobacco related deaths
c. Incidence of lung, mouth, tongue, neck, and throat cancers
d. All of the above

Every patient should be asked about their smoking status because there are many interactions between smoking and several common medications
a. True
b. False

IMPLEMENTATION OF INSULIN PENS IN AN ACADEMIC MEDICAL CENTER

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PURPOSE: In the outpatient setting, insulin pens have many proposed advantages when compared to the traditional insulin vial and syringe. From an inpatient perspective, insulin pens may offer advantages over the insulin vial and syringe such as less insulin wastage (the pen contains 3 mL of insulin whereas the vial contains 10 mL) and a reduced risk of needles sticks (when using safety needles manufactured for the pens). Because of these advantages, The Ohio State University Medical Center has decided to dispense patient-specific insulin pens instead of vials. An evaluation will be done to determine if the transition from insulin vials to pens improves the perception of safety and convenience by the nursing staff. An additional objective of this evaluation is to measure the impact of drug cost and insulin waste after insulin pen implementation.

METHODS: This evaluation was submitted to and approved by the Institutional Review Board. Utilizing the Plan Do Check Act (PDCA) process model, a multidisciplinary team comprised of pharmacists, registered nurses, certified diabetes educators, and infection control met regularly to accomplish the following goals: identify any obstacles with transitioning from insulin vials and syringes to insulin pens, develop a training and education program for all nurses and develop a timeline for implementing insulin pens.

One month after insulin pen implementation, an electronic survey will be distributed to all nurses via email to measure nursing perception of insulin pens in comparison to the vial and syringe. This electronic survey measures responses on a 7-point Likert scale. In addition, the survey will gather limited demographic data such the highest degree obtained, years of nursing practice, and primary area of practice.

RESULTS/CONCLUSIONS: Thus far, the multidisciplinary team has achieved all stated goals, and the nursing education/training program is in progress. Results and conclusions will be presented at the meeting.

Learning Objectives:

Describe the operational obstacles to be considered prior to transitioning from the insulin vial and syringe to the insulin pen.

Understand the strengths of the PDCA model when implementing a change into daily practice.

Self Assessment Questions:

Name at least two proposed advantages of the insulin pen over the insulin vial for inpatient use.

Describe at least two disadvantages of the insulin pen over the insulin vial for inpatient use.

EVALUATION AND IMPLEMENTATION OF BAR CODED PACKAGING IN A MULTI-HOSPITAL SYSTEM

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Objective: Anecdotal reports and case studies state a decrease in medication administration errors by 50-90% with implementation of bar coding technology. Aurora Health Care has a strategic initiative to implement point of care bar coding to improve patient safety. Aurora is a Cerner hospital and will be using Cerner bar coding technology, however, only 20% of medication have a readable bar code. It is our belief that to reduce medication errors, 100% of medication must be readable by our computer system. An evaluation of the best method to package and distribute bar coded medication across a thirteen hospital system will be determined.

Methodology: Several potential strategies are being analyzed to implement bar coded packaging. A detailed financial analysis is being performed to evaluate each strategy. The following costs will be included in the financial analysis: transportation, unit dose pricing, personnel, training, space, and vendor packaged pricing. Discussions among the hospitals to evaluate each strategy are ongoing. The Information System (IS) department is involved to anticipate and resolve technological issues. One strategy will be selected to implement bar coded packaging based on discussions, financial analysis, and IS barriers/capabilities.

Results: Results are pending at this time. Preliminary results are expected by summer 2007.

Learning Objectives:

Describe why bar coding technology is important for patient safety.

List 2 aspects that will be evaluated for each implementation strategy.

Self Assessment Questions:

True/False: Bar coding technology has been demonstrated to decrease medication administration errors.

True/False: A financial analysis is important to conduct when determining a strategy to package and distribute bar coded medication.

COMPARISON OF THE HEALTHCARE OUTCOMES AND COST IMPACT ASSOCIATED WITH MEDICATION THERAPY MANAGEMENT CONSULTATION: A RETROSPECTIVE ANALYSIS

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Purpose:
The objective of this study is to determine if any improvements in healthcare outcomes are associated with MTM consultations.
Methodology:
Those eligible consists of members that are enrolled in Humana's Medicare Advantage-Prescription Drug (MAPD) or Humana's Prescription Drug (PDP) program during the 2006 plan year. Two subject cohorts will be evaluated: 1) MTM eligible members without a qualifying consultation and 2) members that have accepted and completed the MTM consultations. Medical and prescription claims data will be collected and analyzed for a fixed time frame pre/post MTM consult. In detail, the following primary outcome measures will be evaluated: number of hospital admissions; number of ER admits; and number of physician visits for Humana's MAPD population. In addition, various pharmacy and qualitative measures will be analyzed.
Results:
At present, results are pending further analysis.
Conclusion:
The authors hypothesize that the results of this study will identify if Medication Therapy Management consultations, improve healthcare outcomes, and/or promote cost savings.

Learning Objectives:

Understand the various components involved in Medication Therapy Management and how these components can relate to Humana members' overall healthcare.

Identify if there were any improved healthcare outcomes and/or cost savings associated with face to face Medication Therapy Management Consults.

Self Assessment Questions:

What criteria must Humana members meet in order to be MTM eligible in 2007?
A. Drug Spend > $4000.00
B. Member taking more than 8 medications
C. Two or more chronic systemic diseases
D. A&C
E. All the Above

Is Medication Therapy Management mandated by the Center of Medicare and Medicaid Services? T/F

IMPLEMENTATION OF A CARDIOMETABOLIC RISK ASSESSMENT PROGRAM IN A MULTI-SITE GROCERY CHAIN PHARMACY

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PURPOSE: As the number of patients diagnosed with diabetes and obesity continues to rise, the need for early identification of patients with increased cardiometabolic risk and intervention in these patients has become increasingly important. The purpose of this study was to develop a health screening specific for cardiometabolic risk and implement the program in multiple stores across a multi-site grocery chain pharmacy. Previous studies have shown personnel time is one of the major barriers to providing cognitive services. This study developed tactics to address this issue while evaluating the success of the program.

METHODS: A cardiometabolic risk assessment program was implemented in 14 pharmacies of a grocery chain pharmacy. Prior to initiation of the program, a survey was administered to all participating pharmacists, identifying barriers to providing an additional service. A pharmacists' training program was guided by the results of the survey. The study pharmacies were randomized to one of two groups. Pharmacists in Group 1 pharmacies received additional training on workflow management and integration of patient services into their normal dispensing role. This group offered screenings at any time convenient for the pharmacist and his/her staff. Group 2 pharmacies were provided additional staff support on screening days. In both groups, individuals with abnormal screening values were referred to their physician. Four weeks after each screening, pharmacists contacted each referred patient to determine if a follow-up appointment had been made or if any of the pharmacist-recommended lifestyle modifications had been adopted. Evaluation of the screening program was based on the number of screenings performed, number of referrals, and percentage of patients following up with their physician. The cost to conduct the program was determined for both study groups.

RESULTS/CONCLUSIONS: Results and conclusions of the study will be presented at the conference.

Learning Objectives:

Discuss the individual components comprising cardiometabolic risk.

Describe the increased risk of heart disease in patients with multiple metabolic risk factors.

Self Assessment Questions:

Which of the following are included in the criteria for cardiometabolic risk?
a. Blood glucose >120 mg/dL
b. Waist circumference for males >35 inches
c. Blood Pressure >130/85
d. Total cholesterol >200 mg/dL
e. Triglycerides >200 mg/dL

Insufficient personnel time is one of the major barriers to providing cognitive services a community pharmacy setting. T/F

POSITIONING PROPFOL - A CLINICAL WHITE PAPER

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Background/Purpose: Propofol, injectable emulsion, is a sedative hypnotic used for anesthesia and sedation. Its favorable pharmacokinetic profile has lead to increased use of this agent for conscious sedation. However, due to its anesthetic properties administration of propofol by personnel other than anesthesiologists has been subject to scrutiny. To date, clearly defined guidelines do not exist defining who may permissibly administer propofol. Concerns are escalating as propofol use expands beyond the operating room and critical care units. This White Paper will critique propofol's current and prospective use in clinical practice.

Methods: Existing policies and procedures for sedation/analgesia were identified and a medication-use evaluation was completed to identify usage patterns, opportunities for standardization and current administration practices for propofol. This information was used to define who may permissibly administer propofol and appropriate doses for procedures utilizing conscious sedation.
The intent is to publish a White Paper to position the use of propofol for large rural institutions. Issues to be discussed include: standardizing qualifications for personnel administering propofol; dosing and rate of administration for sedation and procedures; establishing supportive care; predicting and assessing individual response(s); training of healthcare professionals; establishing universal definitions for anesthesia, sedation and standardization of sedation scales. The paper will also solicit nursing and medical organizations/governing bodies to develop statements of consensus for propofol administration.

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

Learning Objectives:

Define criteria for permissible use of propofol by healthcare providers and caregivers.

Recommend solutions for the complex issues surrounding the use of propofol for conscious sedation.

Self Assessment Questions:

T/F: Individual patient response(s) to propofol is predictable along the continuum of sedation.

T/F: National guidelines do not exist defining who may permissibly administer propofol.

IMPACT ON CLINICAL OUTCOMES OF AN AMBULATORY CARE PHARMACY RESIDENT-MANAGED TYPE 2 DIABETES MELLITUS DRUG THERAPY MANAGEMENT CLINIC.

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PURPOSE: A pharmacist can play a vital role in helping type 2 diabetes mellitus patients achieve glycemic control and prevent long-term complications through a pharmacist-managed drug therapy clinic. Retrospective data analysis is being conducted to review the data from patients that are seen at an indigent care internal medicine clinic by the ambulatory care pharmacy residents for diabetes mellitus management. The analysis will provide outcome data to determine if patients at the clinic are reaching treatment goals and benefiting from the pharmacists' involvement in their diabetes mellitus management.

METHODS: A retrospective chart review of all patients seen at the clinic for type 2 diabetes mellitus management by the ambulatory care pharmacy residents from October 2005 through January 2006 was conducted. Patients are referred to the pharmacist for disease state management for various reasons including new diagnosis of diabetes, poor glycemic control, poor adherence, and diabetic education where a collaborative practice agreement is established. Data collected includes baseline and endpoint HbA1c, medications, weight, number of visits, no shows and interventions made. Pharmacist interventions involve patient education, drug therapy management, laboratory monitoring, and insulin and glucometer training.

RESULTS/CONCLUSIONS: Data collection and analysis is currently ongoing. Completed results and conclusions will be presented at Great Lakes Pharmacy Residency Conference.

Learning Objectives:

To understand the need for improving glycemic control and preventing the long-term complications associated with diabetes mellitus.

Determine the role of pharmacists in improving outcomes in type 2 diabetes mellitus patients.

Self Assessment Questions:

By establishing collaborative practice agreements pharmacists are able to manage patients' disease states without informing the physician. (T/F)

The current American Diabetes Association recommendation for goal HbA1c is <7%. (T/F)

CLINICAL DECISION SUPPORT: IMPROVING DRUG-DRUG INTERACTION ALERTING

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Background: Computerized physician order entry (CPOE) and clinical decision support tools are often used to together with the goal of providing clinically relevant information and improved patient safety. However, this may not be achieved if an excessive number of clinically insignificant (noise) alerts fire. The ordering user has a more difficult task deciding which alerts to heed. A previous audit at our institution showed drug-drug interaction warnings represent 65% of all alerts. After reviewing the top 30 of these drug-drug interactions, it was discovered that alerts were overridden at the same rate regardless of severity (major, moderate, minor). In response to concerns about alert fatigue, the institution attempted to improve the efficiency of the drug-drug interaction alerting system.

Purpose: The present study will evaluate the impact of decreasing the number of drug-drug interaction "noise alerts" on the efficiency of a clinical decision support tool.

Methods: This study has been submitted and approved by the ENH Institutional Review Board. A multidisciplinary team of physicians and pharmacists evaluated drug-drug interaction alerts during a three month period and made recommendations for specific alerts to be either turned off or down-classed to a lower severity. Additionally, drug-drug interaction alerts were turned off for certain order sets (i.e. a panel of medications that are commonly ordered together). A before-and-after comparison of the drug-drug interaction alert data will be used to assess the significance of theses interventions on the efficiency of the clinical decision support tool.

Results/Conclusion: The results and conclusion of this study will be presented at the Great Lakes Residency Conference.

Learning Objectives:

Identify strategies to improve drug-drug interaction alerting in a CPOE system.

State an example of a drug-drug interaction alert which may be viewed as "a noise alert".

Self Assessment Questions:

True/False The severity of an alert commonly influences the ordering users response to the alert.

True/False An excessive number of alerts can result in the ordering user ignoring clinically significant alerts.

CHARACTERIZATION OF CORTISOL RESPONSE IN SEVERE TRAUMA

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Purpose: Multiple studies have demonstrated the beneficial effects of corticosteroids for relative adrenal insufficiency (RAI) in patients with septic shock. Corticosteroids have been shown to decrease mortality and vasopressor requirements in these critically ill patients. With the recent focus on RAI and sepsis, more emphasis is being placed on screening for RAI in non-septic critically ill patients with hypotension. There is minimal data specific to the trauma population. Trauma patients, who are typically younger with fewer co-morbidities as compared to other critically ill patients, may exhibit a different cortisol response to stress. The purpose of this study is to characterize the early cortisol response in patients with severe traumatic injuries.

Methods: Cortisol response is being examined in trauma patients admitted to the intensive care unit and on the ventilator at two level one trauma centers. In this prospective study, cortisol levels are measured on post-injury days 2 and 4. Physicians and other caregivers are not blinded to the results and are thus free to respond to cortisol levels as they deem appropriate. The data being collected includes: demographics, injury classification, the use of corticotropin stimulation tests, treatment with corticosteroids, and outcomes. Data will be reviewed for trends in cortisol response according to patient characteristics as well as association between cortisol response and subsequent outcome.

Results and conclusions to be presented.

Learning Objectives:

Describe patient populations who should be evaluated for RAI.

Identify an appropriate work-up and treatment plan for these patients.

Self Assessment Questions:

Describe 2 methods for identifying RAI.

List the potential benefits of corticosteroids in patients with RAI.

CLINICAL EFFICACY AND SAFETY OF ADDITION OF ROSIGLITAZONE (AVANDIA) TO METFORMIN, A SULFONYLUREA OR COMBINATION METFORMIN AND SULFONYLUREA THERAPY

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Purpose: Most diabetic patients will require more than one oral medication to control their hyperglycemia due to declining insulin release and sensitivity. Metformin and sulfonylureas are often chosen as first line therapy for treatment and are often used in combination with one another. Inevitably with disease progression, another medication is often required. Rosiglitazone, an oral medication from the thiazolidinedione (TZD) class is commonly used as an additional oral therapy for the treatment of diabetes mellitus (DM), and is a non-formulary medication within the Veterans Affairs (VA) healthcare system. Edward Hines Jr. VA Medical Center has been identified with high utilization of rosiglitazone, yet a large percentage of diabetics are uncontrolled. The purpose of the study is to evaluate the effectiveness and safety of rosiglitazone added to patients taking metformin, a sulfonylurea or both.

Methods: A retrospective, cohort study will be performed at Edward Hines Jr. VA Medical Center. This study will evaluate the safety and efficacy of the addition of rosiglitazone to a medication regimen consisting of metformin, a sulfonylurea or both. All outpatient non-formulary request approvals for rosiglitazone between September 1, 2004 and August 31, 2005 will be reviewed. The primary outcome will evaluate overall reduction in HbA1c after addition of rosiglitazone treatment. Secondary outcomes include percentage of patients attaining HbA1c<7%, subgroup analysis of HbA1c decrease between patients previously on metformin, sulfonylurea or both. Safety analysis will be evaluated, including LFTs, as well as development of heart failure and edema.

Results/Conclusions: Data collection is in process. Results and conclusions will be presented at Great Lakes Residency Conference.

Learning Objectives:

Describe the role of rosiglitazone in diabetes mellitus 2 treatment.

Describe the effectiveness of rosiglitazone in lowering HbA1c.

Self Assessment Questions:

T/F In clinical trials, rosiglitazone decreased HbA1c an average of 2%

Name two relative contraindications to treatment with rosiglitazone.

EVALUATION OF PDA CLOSURE IN PATIENTS RECEIVING IBUPROFEN LYSINE

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Background:
The ductus arteriosus is essential for proper fetal circulation. Functional and anatomic closure of the ductus arteriosus should occur within one week of birth. Failure of ductus closure requires pharmacologic or surgical intervention. Until recently, intravenous (IV) indomethacin has been the drug of choice for the pharmacologic closure of a patent ductus arteriosus (PDA). IV ibuprofen lysine (NeoProfen) was FDA-approved in April 2006 for PDA closure. The package insert for ibuprofen lysine reports 25% of infants in the active group (n = 68) required rescue therapy vs. 48% of infants in the placebo group (n = 68, p = 0.003).

Purpose:
The purpose of this study is to determine the incidence of PDA closure after a single, 3-dose course of IV ibuprofen lysine.

Methods:
This study is a retrospective chart review of patients in the neonatal intensive care unit receiving ibuprofen lysine for PDA closure between October 1, 2006, and March 31, 2007. Patients were included if they completed a full, 3-dose course of ibuprofen lysine (a loading dose of 10 mg/kg, followed by doses of 5 mg/kg at 24 and 48 hours after the loading dose). Secondary efficacy outcomes include the use of a second course of ibuprofen or the use of indomethacin or surgical ligation for PDA closure after a failed initial course if ibuprofen lysine. Safety outcomes will also be evaluated; specific parameters include changes in renal function and incidence of bleeding. Demographic, efficacy, and safety data will also be collected.

Summary of preliminary results:
Data collected between October 1, 2006, and December 31, 2006 indicate 36% of patients receiving ibuprofen lysine (4 out of 11) required rescue therapy (3 patients received an additional course of ibuprofen lysine, 1 patient received indomethacin).

Conclusions:
Final data continues to be collected and will be presented in April 2007.

Learning Objectives:

1. Describe the pathophysiology and consequences of a PDA.
2. Describe the benefits and risks of using IV ibuprofen lysine for PDA closure.

Self Assessment Questions:

What is the recommended dosing regimen for IV ibuprofen lysine?
a. 0.2 mg/kg x 1 dose, followed by 0.1 mg/kg every 12 hours x 2 doses
b. 0.2 mg/kg x 1 dose, followed by 0.1 mg/kg every 24 hours x 2 doses
c. 10 mg/kg x 1 dose, followed by 5 mg/kg every 12 hours x 2 doses
d. 10 mg/kg x 1 dose, followed by 5 mg/kg every 24 hours x 2 doses

Parameters that should be monitored during IV ibuprofen lysine therapy include:
a. Platelet count
b. Serum creatinine
c. Urine output
d. All of the above

A DESCRIPTIVE ANALYSIS OF THE PROCUREMENT PROCESS AND MANAGEMENT OF DRUG SHORTAGES.

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Objective: Drug shortages create many problems for health-system pharmacy managers and clinicians, including the need to develop therapeutic alternatives or use alternative suppliers. Potential negative outcomes from drug shortages include increasing costs, patient safety concerns, and suboptimal patient clinical outcomes. Some of the most common drug shortages clinicians' faces in daily practice include chemotherapy agents, blood products, and antibiotics.

This study has three major objectives. The first objective is to evaluate the procurement process and inventory management of health-system pharmacy members of a Group Purchasing Organization (GPO). Second, this study will describe the process used by health-system pharmacists to manage drug shortages. Third, this study will explore how procurement behavior may affect medication purchasing channels and inadvertently create drug shortages.

Methodology:

A survey will be sent to Directors of Pharmacy that are members of a specific GPO. The survey will collect data on health-system demographics, procurement practices, and approaches to managing drug shortages.

Results will increase understanding of procurement processes and management of drug shortages. Recommendations will be developed to improve the procurement process and drug shortage management within health-system pharmacy practice.

Learning Objectives:

Increase your understanding of the drug shortages issue in Health-System Pharmacy Practice

Describe the strategies used by hospitals to manage drug shortages

Self Assessment Questions:

Explain some of the relevant issues that drug shortages create in Pharmacy Practice?

What are some common strategies used to manage drug shortages?

EVALUATION OF THE TREATMENT OF PATIENTS WITH SEVERE SEPSIS AND SEPTIC SHOCK IN ACCORDANCE WITH THE SURVIVING SEPSIS CAMPAIGN GUIDELINES

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Purpose: Severe sepsis is a complex, infection-induced syndrome resulting in a systemic inflammatory response complicated by at least one organ system failure. Approximately 750,000 cases of sepsis occur each year in the United States with an associated mortality of 30% to 50%. Sepsis is considered to be one of the most challenging conditions to define, diagnose, and treat as the course varies widely among patients and it develops as a result of a variety of circumstances. Rapid diagnosis and goal-directed therapy is imperative to successful treatment of sepsis. To help meet the challenges of management, diagnosis, and treatment of severe sepsis and septic shock, the ESICM (European Society of Intensive Care Medicine), ISF (International Sepsis Forum) and SCCM (Society of Critical Care Medicine) have organized the Surviving Sepsis Campaign and published guidelines to define a standard of care. To date, diagnosis and treatment practices have not been evaluated or standardized at Wishard Memorial Hospital. Research describing current management of severe sepsis at this institution is needed to identify areas of non-compliance with the Surviving Sepsis Campaign guidelines.

Methods: Retrospective evaluation of patients with severe sepsis admitted to Wishard Memorial Hospital, a 320-bed, public teaching hospital between January 1 and December 31, 2006. Data collected includes patient demographics, initial resuscitation measures including times of onset and initiation of treatment, diagnosis, antibiotic, fluid, and vasopressor therapy, source control measures, need for steroids, blood products, renal replacement therapy, mechanical ventilation, recombinant human activated protein C, and glucose control. The primary objective of the study is to characterize and quantify current adherence to published guidelines. Secondary objectives include identifying areas of non-compliance with guidelines and methods to streamline appropriate interventions including standardizing order sets and heightening awareness of proven benefit associated with an early diagnosis and goal-directed therapy.

Results and Conclusions: To be presented.

Learning Objectives:

Describe the current challenges to the appropriate management of severe sepsis and how streamlining early, goal-directed therapy improves outcomes.

Recognize components of the Surviving Sepsis Campaign guidelines and other current literature supporting early, goal-directed management of severe sepsis.

Self Assessment Questions:

The successful management of severe sepsis relies on early diagnosis and goal-directed therapy. T/F?

Proven beneficial interventions in patients with severe sepsis include all of the following except: antibiotic therapy, fluid restriction, source control measures, and glucose control.

DEVELOPMENT OF A CLINICAL PHARMACIST WORKLOAD AND PRODUCTIVITY MONITORING SYSTEM

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The purpose of this project is to improve staffing allocation of clinical pharmacists within the UWHC Pharmacy Department. The objective of this project is to develop a clinical pharmacist workload and productivity monitoring system that will determine correlations between objective and readily available department workload and statistical data with pharmacist workload perception data. Correlation between these data sources will be utilized in the design of a mathematical model to monitor decentral pharmacist workload requirements.

Pharmacist workload perception data was collected over five weeks using a homegrown survey tool. A series of database queries were ran extracting objective workload metrics data from internal databases over the same time period as the pharmacist perception data was collected. A multivariate regression analysis will be run against the objective measurable workload metrics data and the pharmacist workload perception data to see what correlations may exist.

Following the regression analysis, a mathematical model will be developed to monitor pharmacist workload and productivity trends. This model will incorporate time standards based allocation of workload units as well as perception weighted objective workload metrics data. This model will be used to compare decentral clinical pharmacist staffing allocation across units and equity of coverage to maximize the quality of pharmacy services and to provide pharmacy managers with an ongoing tool for assessing and better managing pharmacist workload by area of the hospital and service.

At time of abstract submission, pairing of pharmacist workload perception data and objective workload metrics data have been completed and will subsequently undergo statistical analysis.

Preliminary results of a sample pharmacist shift would suggest that correlations do exist between workload perception and distinct objective workload metrics, thus supporting the conclusion that a valid workload and productivity monitoring system can continue to be developed on the basis of the available data sources and workload metrics.

Learning Objectives:

Data repositories external to the pharmacy department may contain highly useful data metrics that can support pharmacy department labor and productivity management.

When analyzing pharmacy department workload and productivity metrics ensure that causes of reported workload increase or decrease are system causes and not special causes.

Self Assessment Questions:

Who will be responsible for the continuation of this project after residency program completion, and how will I effectively educate and transfer this project to the appropriate personnel to ensure its continued success and progression?

With our institution adopting and implementing a new electronic medical record and pharmacy order entry system, how can I help integrate my project and transfer its utility into the new hospital computer system?

PROVING THE BENEFITS OF A PHARMACIST IN THE EMERGENCY DEPARTMENT

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Purpose: Pharmacists have been proven to be of cost-savings and clinical benefit in a wide variety of patient care settings, however, infrequently utilized in the Emergency Department (ED). Munson Medical Center is currently a 368-bed community teaching hospital and newly certified Level II Trauma Center. With the opening of Munson's new 43-bed ED January 30, 2007, a six-month pilot has been approved for a full-time pharmacist in the ED. The role of the pharmacist will be to conduct medication reconciliation for patients with greater than 5 medications and being admitted to the "Hospitalist's" service, dispense i.v. antibiotics and critical care drips, ensure correct use of antimicrobial therapy, provide code response, medication counseling, drug information services, and patient and staff education. Currently, the ED is supported by pharmacy from the central pharmacy. The purpose of this study will be to prove the benefits of a pharmacist in the ED.

Methods: A survey will be distributed to nursing staff and physicians in the ED before the pilot begins to measure their satisfaction level with pharmacy services, and again, after the six-month pilot is complete. Also, all interventions made by the ED pharmacist will be documented and extrapolated to an annual cost savings for the institution based on current literature. If these measures are favorable, a permanent position for an ED pharmacist will be created.

Results: The pharmacy resident will complete the first two months of data for the months of Feburary and March 2007. Preliminary results will be revealed at the Great Lakes Pharmacy Residency Conference. These results will be employed to continue and expand ED pharmacy services at Munson Medical Center.

Learning Objectives:

Analyze the data measured to prove cost-savings and clinical benefit of an ED pharmacist.

Demonstrate the pharmacy services that will be provided in the future by the ED pharmacist.

Self Assessment Questions:

Which of the following services can a pharmacist provide in the ED?

A. Drug information
B. Medication reconciliation
C. Prevent adverse drug events
D. Provide staff education
E. All of the above

True or False: ED pharmacists can help meet CMS core measures and provide a cost-savings to their institution.

COMPARISON OF CLINICAL IMPACT BETWEEN A PHARMACIST ROUNDING WITH POST-ADMISSION INTERNAL MEDICINE TEAMS VERSUS A PHARMACIST FOLLOWING A TARGET DRUG APPROACH

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Background: Several studies demonstrate improvement in patient outcomes in intensive care units through the addition of a pharmacist to the patient care team. Fewer studies consider exclusively the role of a clinical pharmacist in the internal medicine wards. Many admissions due to chronic disease state exacerbations result from improper medication therapy. Increasing a pharmacist's interaction in this patient population could improve the care of the patient and avoid future disease state exacerbations.

Methodology: This Institutional Review Board approved study was a prospective, cohort study of 203 adult internal medicine patients admitted to the University of Louisville Hospital (ULH) during a 5-week period. The control group received the clinical services currently provided by the pharmacy staff. These services included monitoring only patients who received target high-risk medications and did not involve rounding with internal medicine teams. The study group received clinical pharmacy services from a clinical pharmacist who rounded with post-admission internal medicine teams.

Results/Conclusions: The study group had a significant increase in pharmacy interventions per patient (2.49 2.30 vs. 0.66 1.18). In the study group, medications were initiated for an untreated indication, and discontinued when used without an appropriate indication more often than in the control group (32 vs. 3 and 22 vs. 5, respectively). Pneumococcal and influenza vaccine screenings by the pharmacist resulted in significantly more vaccinations in the study group (95 vs. 10). In the subset of patients with diabetes, hypertension or asthma/COPD, the study group averaged a much higher rate of interventions per patient (2.64 2.47 vs. 0.63 1.20). Based on this initial data, the addition of a pharmacist to internal medicine patient care rounds significantly increased interventions by the clinical pharmacy staff. Economic data has been collected and results will be presented at the conference.

Learning Objectives:

Discuss the limitations of the target-drug approach for clinical pharmacy services at ULH.

Identify types of patients that are typically underserved by target-drug directed clinical pharmacy services at ULH.

Self Assessment Questions:

Patients with which of the following disease states are NOT commonly monitored by a pharmacist at ULH with the current target-drug approach?

a.Diabetes
b.Hypertension
c.Asthma/COPD
d.All of the above
e.None of the above

True or False: Pharmacists screening internal medicine patients for pneumococcal and influenza vaccinations resulted in an increased number of vaccinations.

IMPACT OF A PHARMACIST ON MEDICATION RECONCILIATION UPON ADMISSION TO A VETERANS AFFAIRS MEDICAL CENTER

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PURPOSE Medication errors are a leading cause of injury to hospitalized patients, and studies reveal that these errors occur most often at transitions of care. To reduce medication errors, the Joint Commission has made medication reconciliation a National Patient Safety Goal. The primary objective of this study is to evaluate a pharmacist's impact on medication errors at the Lexington Veterans Affairs Medical Center (VAMC) through pharmacy involvement in medication reconciliation at patient admission. The hypothesis that a pharmacist based intervention program will reduce unreconciled medications by 50% will be tested. The secondary objective is to determine the cost savings to the VAMC.

METHODOLOGY A retrospective, observational, single-center study was conducted to evaluate our facility's pharmacist-initiated medication reconciliation program. The study was a comparison between pre-and post-program data. In both phases, electronic medical records were evaluated by comparing the outpatient medication profiles and inpatient medication orders for discrepancies. Inclusion criteria consisted of patients with outpatient medications who were admitted to the Lexington VAMC for at least 72 hours. The primary outcome measure is the percentage of unreconciled medications. Secondary outcomes of cost savings to the VAMC will be evaluated using the number of medications discontinued due to medication reconciliation and potential adverse events avoided. For statistical analysis, differences between groups will be tested using the chi square test for categorical data and the appropriate parametric or non-parametric test (t-test or Wilcoxon rank sum). P-values of 0.05 will be statistically significant.

RESULTS/CONCLUSIONS Data collection is ongoing. Results and conclusions will be presented at Great Lakes Residency Conference.

Learning Objectives:

Define medication reconciliation and its importance in hospital admissions.

Evaluate the impact of a pharmacist on medication reconciliation upon patient admission.

Self Assessment Questions:

T/F The addition of a pharmacist to the medication reconciliation process reduced the number of medication discrepancies.

T/F An overall cost savings to the VAMC was demonstrated with an addition of a pharmacist to the admissions medication reconciliation process.

OUTCOMES ASSESSMENT OF AN INPATIENT PHARMACIST - MANAGED WARFARIN PROTOCOL IN AN ACADEMIC MEDICAL CENTER: COMPARATIVE ANALYSIS OF PHARMACIST-MANAGED AND PHYSICIAN-MANAGED WARFARIN THERAPY

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The Institute for Safe Medication Practices classifies warfarin as a high alert medication. Furthermore, warfarin has a narrow therapeutic index, requiring careful dosing and monitoring. Management of warfarin therapy is complex and can be influenced by numerous patient factors, including drug interactions, disease states, diet, age, and cytochrome P 450 polymorphisms. To ensure patient safety and efficacy, it is important that one is initiated and maintained on an appropriate dosage of warfarin. In the ambulatory setting, pharmacists have been managing warfarin therapy for years, while the management of warfarin for hospital inpatients remains a less common practice. The objective of this project is to assess the impact of a pharmacist-managed warfarin protocol at an academic medical center.

Two-hundred inpatients initiated on warfarin therapy between September 2006 and January 2006 will be identified using the department of pharmacy's computer system. One-hundred of those patients will have their warfarin therapy initiated and managed by pharmacists, with the remainder by physicians. The following data will be collected on each patient: daily international normalized ratio (INR), daily warfarin dose, warfarin indication, target INR, medical conditions, hemorrhagic risk factors, other anticoagulants, interacting medications, sensitivity factors, sensitivity level, initial warfarin dose, time to therapeutic INR, incidence of high INR, warfarin related adverse events, and use of warfarin reversal agents. Patient charts will be reviewed to determine prescriber rationale for dose determination. Outcome data collected on patients managed by pharmacists will be compared to that of those managed by physicians. This data will be used to propose the expansion of the institution's pharmacist-managed warfarin protocol to all inpatients receiving warfarin therapy, including those on warfarin therapy prior to admission.

Data collection is currently in progress. Results and conclusions will be presented at the conference.

Learning Objectives:

To understand and assess appropriate management of inpatient anticoagulation therapy

To understand the process of protocol implementation

Self Assessment Questions:

True or False. International normalized ratios can be affected by changes in medications, changes in diet, patient age, and disease states.

True or False. It is not important to assess patient sensitivity to warfarin prior to recommending an appropriate starting dose.

IMPACT OF AN ANTIMICROBIAL STEWARDSHIP PILOT PROGRAM ON CLINICAL AND ECONOMIC OUTCOMES

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Background: An estimated 25 to 50 percent of all hospitalized patients in the United States each year receive antibiotics. When antimicrobials are used inappropriately, consequences may include increased cost, adverse events and the emergence of resistant organisms. In an effort to minimize inappropriate use, hospitals across the US have adopted several strategies, including antimicrobial stewardship programs. Antimicrobial stewardship is defined as optimal drug selection, dose and duration that results in favorable patient outcomes while minimizing cost and resistance development.

Methodology: This study is a prospective evaluation of 50 patients, age 18 years or older who receive at least one target antibiotic during the month of January 2007. Exclusion criteria include surgical prophylaxis, labor and delivery patients, and infectious disease or pharmacist consulted patients. Data collected included: patient demographics, vitals and pertinent laboratory data, length of inpatient hospital stay, type and site of infection, identified pathogen and susceptibility data, number of days on empiric therapy, adherence to empiric guidelines, total number days on intravenous and oral antibiotics, total antibiotic cost and recommendation acceptance rate. Antibiotic recommendations were communicated by telephone conversation with the physician or a non-permanent note placed in the patient's chart. Results from this prospective analysis will be compared to a retrospective chart review of patients, matched for diagnosis (ICD-9 code) during January and February 2006. Statistical analysis will be performed to evaluate the data collected.

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

Learning Objectives:

Describe the potential benefits of a multidisciplinary antimicrobial stewardship program on optimizing antimicrobial management and minimizing healthcare costs.

Discuss the steps necessary to implement a successful antimicrobial stewardship program.

Self Assessment Questions:

True or False: Studies have shown an increase in patient mortality as a result of inappropriate antimicrobial use.

Name three strategies utilized by healthcare institutions to combat inappropriate antimicrobial prescribing.

PHARMACIST FALL RISK ASSESSMENT AND INTERVENTION PROGRAM EVALUATING THE EFFECTIVENESS OF A FALL REDUCTION PROGRAM IN AN INPATIENT COMMUNITY HOSPITAL.

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Objective: Patient falls are among the most commonly reported adverse event in acute care facilities and result in significant morbidity and mortality. One of the Joint Commission on Accreditation of Healthcare Organizations' (JCAHO) National Patient Safety Goals is to reduce the risk of patient harm resulting from falls by implementing a fall reduction program. A fall reduction program was implemented in order to reduce the number of medications that may be contributing to falls in our hospital. The objective of this study is to evaluate the effectiveness of the falls screening program in identifying medications that place a patient at increased risk for falls and assessing the appropriateness of interventions that are made to prevent future falls.

Methodology: For each patient identified to be at risk for falls, the pharmacist is able to enter a special screening created for the computer system that identifies the patient as having a risk for falls. If medications that increase risk of falls are entered on these patients, a cautionary notification is displayed on the computer screen. The pharmacist will then make an appropriate intervention and document that intervention. An intervention may be to consult the doctor and recommend a change in dose or an alternative medication. For the patients that are reported to have fallen, a retrospective review of those patients' medical records will be completed. The data analysis will include the number of patients identified for fall risk, patients meeting the criteria for fall risk screening, medications on a patient's profile that are flagged as a potential cause for increase risk of falls, and interventions made by the pharmacist. Data analysis will also include whether the physician accepted the recommendation and if future recurrent falls were prevented.

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

Learning Objectives:

Describe the effect that pharmacists can have on preventing patient falls.

Identify medications that may increase the risk of patient falls.

Self Assessment Questions:

Medications should be reviewed for falls risk assessment:
a)on admission
b)at discharge
c)whenever there is a change in medications, including dose adjustment
d)all of the above

Intrinsic risk factors for falls may include:
a)urinary incontinence
b)impaired vision
c)psychoactive medication
d)all of the above

REVIEW OF THE CONCURRENT USE OF SIROLIMUS AND VORICONAZOLE: A PILOT STUDY

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PURPOSE: Co-administration of voriconazole and sirolimus is contraindicated due to the major drug interaction resulting in elevated plasma concentrations of sirolimus. However, transplant recipients may require concurrent therapy with sirolimus and voriconazole in order to maintain immunosuppression while treating invasive fungal infections. The purpose of this observational, retrospective study was to describe the co-administration of voriconazole and sirolimus in inpatients at the University of Michigan Hospitals.

METHODOLOGY: The study received IRB approval in December 2006. Inpatients who received at least one dose of voriconazole and sirolimus concomitantly within a twenty-four hour period were included. Patients were excluded if they were not inpatients or did not receive the two agents concomitantly within a twenty-four hour period. Data collected included the indications for sirolimus and voriconazole; the dose, route, frequency, and time of administration of the two agents; the number of days of co-administration; and dose adjustments of sirolimus, if any. Laboratory values, sirolimus concentrations, and other medications, including other immunosuppressive agents, other antifungal agents, steroids, cytochrome P450 3A4 inhibitors and inducers, and p-glycoprotein inhibitors and inducers, and adverse effects were collected for the seven days prior to, during, and for fourteen days after the co-administration of voriconazole and sirolimus. Lastly, information regarding transplant rejection or death was also collected.

RESULTS/CONCLUSIONS: Based upon the data collected, the authors will summarize the management of the drug interaction between voriconazole and sirolimus at the University of Michigan. Descriptive statistics will be used to analyze quantitative data. The results of this study may aid in the characterization of the drug interaction between voriconazole and sirolimus, and in turn, help determine how clinicians should manage this drug interaction in order to best treat patients who require therapy with both agents.

Learning Objectives:

Identify the indications for co-administration of voriconazole and sirolimus.

Describe the time course and magnitude of the drug interaction between sirolimus and voriconazole.

Self Assessment Questions:

Therapy with immunosuppressive agents is a risk factor for invasive fungal infection after transplantation. T/F

Voriconazole inhibits CYP450 3A4, an enzyme that is responsible for the metabolism of sirolimus. T/F

RETROSPECTIVE AND CONCURRENT USE OF ARGATROBAN AND FONDAPARINUX (ARIXTRA) FOR THE PROPHYLAXIS AND/OR TREATMENT OF TYPE II HIT AND DEVELOPMENT OF AN ARGATROBAN DOSE TITRATION PROTOCOL

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Heparin-induced thrombocytopenia (HIT) is an uncommon but potentially devastating sequela of therapy with heparins. It occurs in up to 5% of patients on unfractionated heparin (UFH) and in < 1% on low molecular weight heparin (LMWH). Treatment of HIT is quite complex as medication options are limited. The use of direct thrombin inhibitors (DTIs) such as argatroban, have been the mainstay of therapy for HIT; however, the optimal dose and titration schedule has yet to be determined. More recently, fondaparinux, a selective factor Xa inhibitor, has been used in these patients as an alternative to DTIs, but its place in therapy for HIT remains unclear. Also, the focus of national quality groups, like ISMP and JCAHO, on the appropriate use of anticoagulants in hospitalized patients has raised numerous concerns about the proper management of patients with HIT at ALGH.

Purpose

The objectives of this study are to develop guidelines for use along with a dose titration protocol for argatroban, and to evaluate the use of fondaparinux for the prophylaxis and/or treatment of HIT.

Method

This retrospective and concurrent chart review will include adult (> 18yr) subjects with HIT who have received argatroban and/or fondaparinux for HIT from April 2004 - March 2007. Data collected includes demographic information, platelet count, partial thromboplastin time (PTT), dosage changes and intervals. The data collected will be used to identify trends in the dose titration and to formulate an argatroban dose titration protocol. The review will also provide information on fondaparinux, such as indication, dose, and clinical outcomes. This data will be used to review fondaparinux for addition to the ALGH formulary.

Conclusion

Data collection is still ongoing. Preliminary results and conclusions will be presented.

Learning Objectives:

To understand how the dose of argatroban is adjusted based on PTT values.

To evaluate the use of fondaparinux in patients with heparin-induced thrombocytopenia.

Self Assessment Questions:

True or False It is not necessary to adjust the dose of argatroban for patients with renal dysfunction.

True or False Fondaparinux is FDA approved for the prophylaxis and/or treatment of DVTs in patients with HIT.

ASSESSMENT OF RISK FACTORS ASSOCIATED WITH ELECTROLYTE ABNORMALITIES IN PATIENTS RECEIVING CETUXIMAB

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Cetuximab (Erbitux) is a recombinant, human/mouse chimeric monoclonal antibody that binds to the epidermal growth factor receptor (EGFR) on both normal and tumor cells. Many human cancers, including those of the head and neck, colon, and rectum, express EGRF on their surface and therefore this drug provides a new mechanism for cancer treatment. During pre-marketing controlled clinical trials, an increased incidence of both overall and severe hypomagnesemia was observed in patients receiving treatment. Electrolyte abnormalities, including hypomagnesemia, hypokalemia, and hypocalcemia, have also been reported in post investigational studies. Current published literature recommends periodic monitoring of serum electrolytes throughout and following therapy, although no specific recommendation on frequency is given.

The primary objective of this study is to review the incidence of hypomagnesemia, hypokalemia, and hypocalcemia in patients receiving cetuximab. Through this review, this study seeks to identify factors associated with these abnormalities in hopes of assessing the appropriateness of current monitoring practice and develop guidelines for monitoring.

Approval for this study was obtained from the University of Cincinnati Investigational Review Board. Patients who have been treated with cetuximab at the University Hospital, Barrett Cancer Center, and physician private practice during the time period of February 2004 through October 2006 were identified through management system reports, drug administration records, and billing reports and were included in this retrospective review. Data collected on each patient included demographics, cetuximab/chemotherapy treatment information, and laboratory values, including electrolytes.

Interim data collection has identified 39 patients who received cetuximab, with 20 males (51%) and 19 females (49%). Six types of cancer have been identified as receiving treatment. A multivariate analysis is currently being preformed on this data to review the incidence of electrolyte abnormalities and determine if any risk factors exist that would predispose patients to experience electrolyte abnormalities during treatment with cetuximab.

Learning Objectives:

To review current literature and data on electrolyte abnormalities associated with cetuximab.

To discuss the complications of electrolyte abnormalities in patients receiving cetuximab.

Self Assessment Questions:

T/F: The proposed mechanism by which hypomagnesemia occurs is due to EGFR inhibition in the nephron and the gastrointestinal tract, which reversibly impairs active transport of extracellular magnesium and magnesium absorption

T/F: Cetuximab's effects on electrolytes may continue for up to months following cessation of therapy

CHARACTERIZING PROPHYLAXIS WITH ANTI-INFECTIVES IN PATIENTS WITH HEMATOLOGIC MALIGNANCIES RECEIVING MYELOSUPPRESSIVE CHEMOTHERAPY

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Background: The administration of antibiotic, antifungal, and antivirals prophylactically in patients receiving myelosuppressive chemotherapy is currently controversial. Current guidelines advise against the use of prophylactic anti-infectives in patients receiving chemotherapy, because studies indicates that these drug do not reduce mortality. Additional concerns include drug resistance, toxicity, and cost. Many providers routinely prescribe prophylactic anti-infectives with substantial inter- and even intraprovider variability in prescribing patterns.

Study Objectives: The primary objectives of this study are to characterize the prescribing of antibiotic, antifungal, and antivirals prophylacticallyand identify outcomes such as infection, hospitalization and death, in the absence and presence of prophylactic anti-infectives in patients receiving myelosuppressive chemotherapy for a hematologic malignancy at the University of Illinois Medical Center (UIMC).

Methods: This is a retrospective study in patients with hematologic malignancies who received myelosuppressive chemotherapy defined as an incidence of febrile neutropenia predicted to be >20% based on the current clinical practice guidelines and/or risk for prolonged neutropenia (>7 days) as defined by the current IDSA guidelines, and/or receiving treatment that alters cellular immunity during the a three year study period. All adult patients diagnosed with a hematologic malignancy treated with myelosuppressive chemotherapy at the UIMC will be included in this study. Outcome measures include infection, hospitalization, death, and anti-infective administration. Statistical analysis using a Fisher test or Wilcoxon test will be used to compare the outcome measures in the absence and presence of anti-infective prophylaxis. An a priori p value of <0.05 will be used to determine statistical differences

Conclusions: Data collection is currently ongoing.

Learning Objectives:

1.Identify the risks and benefits of infection prophylaxis in patients diagnosed with hematologic malignancies who receive myelosuppressive chemotherapy

2.To compare the morbidity and mortality with and without infection prophylaxis in patients diagnosed with hematologic malignancies who receive myelosuppressive chemotherapy

Self Assessment Questions:

1.The Infectious Disease Society of America (IDSA) guidelines recommend routine infection prophylaxis in all patients who receive myelosuppressive chemotherapy for hematologic malignancies. True or False.

2.List three disadvantages to the use of routine infection prophylaxis for myelosuppressive chemotherapy in patients with hematologic malignancies.

EFFECT OF MANNITOL VERSUS HYPERTONIC SALINE IN PATIENTS WITH ELEVATED INTRACRANIAL PRESSURE

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Elevated intracranial pressure (ICP) is a major complication affecting many patients in the neurosurgery population. Patients that suffer from elevated ICP have worse outcomes, longer hospital stays, potential to develop permanent neurological deficits, and ultimately a higher mortality rate. Infusion of hyperosmolar solutes is one of the current treatments used to lower ICP. The theory behind hyperosmolar therapy is the reduction in brain water content through osmotic shift into the intravascular space, thereby, reducing ICP. Boluses of 20% mannitol solution have been the gold standard of therapy for decreasing ICP, but it has been associated with increased incidence of renal failure. Recent data from multiple clinical trials have identified hypertonic saline =as an alternative to mannitol for reducing ICP. The primary objective of this study is to observe the efficacy between the use of 20% mannitol boluses and 23.4% boluses for lowering ICP. This study will be submitted to the Institutional Review Board for approval prior to commencement. A list of patients that received mannitol or hypertonic saline between January 2005 and October 2006 will be generated from the hospital's electronic medical record system Retrospective chart review will be performed to compare efficacy of 20% mannitol and 23.4% hypertonic saline for decreasing ICP. Subjects >18 years admitted to the NSICU with elevated ICP (>20mmHg) due to neurosurgery, ICH, SAH, tumors, traumatic brain injury, infection, or hydrocephalus. Data that will be collected includes: patient demographics, past medical history, diagnosis, baseline renal function, laboratory markers, patient disposition, type of bolus administered, ICP before and after bolus, CPP before and after bolus, serum sodium, serum osmolality, and urine output. All data will be recorded without patient identifiers and maintained confidentially. The data will be used to compare the efficacy and safety of mannitol versus hypertonic saline boluses by observing the decrease in ICP.

Results and conclusions remain under investigation, with data collection and evaluation currently being conducted.

Learning Objectives:

Explain the mechanism of action of hyperosmolar therapy in the treatment of elevated ICP.

Distinguish between the two types of hyperosmolar therapy used for treatment of elevated ICP based on efficacy and side effect profile: mannitol and hypertonic saline.

Self Assessment Questions:

Hypertonic saline (HTS) has been the standard of care for decreasing ICP in the neurosurgery population. T or F

Mannitol has a higher incidence of acute renal failure than HTS. T or F

EVALUATION OF AN INFECTIOUS DISEASES PHARMACIST AT A LARGE COMMUNITY TEACHING HOSPITAL AND MEDICAL CENTER

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Background: Antimicrobial resistance is a common issue in hospitalized patients. Strategies to combat resistance include the development of new antimicrobials and encouraging the judicious use of current antimicrobial therapies through antimicrobial stewardship. The Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America have recently published updated guidelines describing essential elements of an antimicrobial stewardship program. It describes developing a multidisciplinary team including an infectious diseases physician and a pharmacist with infectious diseases training. The core strategies include prospective interventions with feedback and creating restrictions to the antimicrobial formulary.

Purpose: Evaluate and quantify infectious diseases-related pharmacist interventions at a large community teaching hospital and medical center.

Methodology: Working with our staff infectious diseases physicians and interviewing local infectious diseases pharmacists, four key areas for improvement were chosen for evaluation. This study will document and analyze over a one-month time period, 1) the use of restricted and criteria-monitored antimicrobials, 2) antimicrobial usage in the medical intensive care unit (MICU), 3) optimal antimicrobial therapy based on positive blood culture results, and 4) opportunities to intervene with antiretroviral regimens. A daily report of patients prescribed selected restricted and criteria-monitored medications will be generated and assessed for adherence to criteria and interventions will be related to previous medication utilization data. All patients on antimicrobials in the MICU will be assessed for optimal selection of agent(s), durations of therapy, avoidance of excess use of antianaerobic agents, and collection of blood and sputum cultures in intubated patients with suspected pneumonia. A daily report of positive blood cultures and susceptibilities will be analyzed to ensure optimization of antimicrobial therapy. Finally, a report of patients on antiretroviral medications will be generated daily to ensure home dosages have been reconciled, drug-drug interactions assessed, and education and counseling provided.

Learning Objectives:

Describe and quantify infectious diseases-related pharmacist interventions at a large community teaching hospital and medical center.

Describe the role of the infectious diseases pharmacist in an antimicrobial stewardship program.

Self Assessment Questions:

According to the recently published guidelines on antimicrobial stewardship by IDSA/SHEA, core members of an antimicrobial stewardship program should include an infectious diseases physician and a pharmacist with infectious diseases training. T/F

What are two key areas of focus identified by the project to evaluate and analyze the usage of antimicrobials?

NUTRITION SUPPORT AFTER ESOPHAGOGASTRECTOMY: A CAUTIONARY TALE

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Background: Esophageal cancer is diagnosed in about 13,000 people annually in the United States; it is responsible for approximately 1.5-5% of cancer deaths each year. Esophagogastrectomy with esophagogastric anastomosis continues to be the treatment of choice for these patients. Anastomotic breakdown is a significant early complication of esophagogastrectomy, occurring in 5% to 29% of patients'. If a jejunal feeding tube is not placed and used properly, it necessitates the use of parenteral nutrition (PN) in these often nutritionally compromised patients. The goal of this study is to assess the outcomes associated with short-term parenteral nutrition use.

Methods: A retrospective review of all patients who had an esophagogastrectomy during calendar year 2004 who post operatively required PN. The following information was obtained: indication for PN need, length of stay, cost of therapy, discharge status, and laboratory data including electrolytes and prealbumin.

Results: The patient population consisted of 22 patients undergoing both total and partial esophagectomy. A total of 316 days of PN support was required with an average of 13.7 days (range 2 - 44 days). There were 11 blood stream infections (BSI) resulting in a BSI rate of 36 per 1000 catheter days (NNIS 90% 5.3). There were 222 days with the mean glucose >120 gm/dl with a mean glucose of 173. The overall hospital discharge mortality rate was 4%.

Conclusions: Compared to enteral nutrition published data, the complication rate, and additional charges on this group of patients receiving PN are significant and should bolster the practice of placing of a jejunostomy tube at the initial surgery. Enteral feeding leads to few complications, and it is generally well tolerated.

Learning Objectives:

To identify complications associated with parenteral nutrition utilization.

To identify an alternative nutritional plan after esophagogastrectomy to maximize patient outcomes.

Self Assessment Questions:

Parenteral nutrition is being optimized in situations were the risk outweighs the benefit. T or F

In various studies, alternative nutritional therapy can be optimized so patients to decrease recovery time. T or F

EVALUATION OF SEVERE SEPSIS/SEPTIC SHOCK PROTOCOL COMPLIANCE IN AN ADULT CRITICAL CARE UNIT

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Purpose: Patients developing severe sepsis and septic shock have mortality rates as high as 35%. Early goal-directed therapy has been shown to increase survival in these patients. In 2005, a severe sepsis/septic shock protocol adapted from the Surviving Sepsis Campaign was developed at Advocate Christ Medical Center. The objective of this performance improvement study is to evaluate appropriate initiation, compliance, and outcomes associated with the implementation of a sepsis protocol in an adult medical intensive critical care unit (MICCU).

Methods: Patient information will be collected retrospectively after initiation of the sepsis protocol. Each case will be assessed for appropriate selection (systemic inflammatory response syndrome criteria, organ dysfunction, and infection). Then, the following indicators will be collected: admission category (admitted to MICCU from the emergency department, transferred from another unit, or admitted to MICCU for another diagnosis and developed sepsis), serum lactate level and time taken, use of broad-spectrum antibiotics and time given, if blood cultures drawn and if before the first dose of antibiotics, whether the patient was hypotensive and received proper fluid resuscitation and vasopressors, maintenance of central venous pressure = 8 mmHg, central venous oxygen saturation levels, appropriate steroid and drotrecogin alfa administration, median glucose levels, and if the patient was mechanically ventilated. Times of presentation, sepsis diagnosis, and discharge will also be recorded.

All data will be inputted into the Surviving Sepsis database produced by the Society of Critical Care Medicine, European Society of Intensive Care Medicine, and the International Sepsis Forum, for assessment. Data will be evaluated for compliance with the various aspects of the protocol, outcome, and will be compared to a control group consisting of patients treated for severe sepsis prior to the implementation of the standardized treatment protocol.

Results: Data collection in process and descriptive results are pending.

Learning Objectives:

Identify diagnostic criteria for initiating the severe sepsis/septic shock protocol.

Describe the components of early-goal directed therapy in treating severe sepsis and septic shock.

Self Assessment Questions:

Which of the following is not an objective of early-goal directed therapy in severe sepsis and septic shock?
a. Maintain CVP = 8 mmHg
b. Blood cultures are drawn before antibiotic administration
c. Glucose levels > 150 mg/dL
d. Fluid resuscitation if SBP < 90

T/F Developing septic shock increases a patient's risk of mortality.

IMPLEMENTATION AND EVALUATION OF AN ANTIBIOTIC MANAGEMENT PROGRAM USING AN INTEGRATED COMPUTERIZED INFORMATION SYSTEM

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Antibiotic stewardship strategies encompass many types of activities that can serve to optimize patient care, reduce medication costs, and potentially decrease antibiotic resistance. Currently at Froedtert Hospital, a 430-bed academic medical center, piperacillin/tazobactam, linezolid, and imipenem-cilastatin together account for nearly 50 percent of the total antibiotic expenditure. The objective of this project is to develop and implement an antibiotic management program using an integrated computerized information system to improve antibiotic stewardship at the institution.

A retrospective review of patients receiving piperacillin/tazobactam, linezolid, and imipenem-cilastatin was conducted to determine antibiotic usage prior to implementation of an antibiotic management program. Discussions with staff regarding the current antibiotic management workflow and a review of the literature were used to develop an antibiotic management program using the existing integrated computerized information system. The proposed program will be implemented and monitored for several months. When an order for piperacillin/tazobactam, linezolid, or imipenem-cilastatin is entered into the computer system, a report will be generated and displayed for the pharmacist. Pharmacists will automatically enter a 72 hour stop date on all empiric orders for these antibiotics. At the completion of 72 hours of empiric antibiotic therapy, pharmacists will follow up with physicians to reevaluate the appropriateness of the therapy based on culture results and the patients' clinical condition. Information such as the indication for therapy, culture orders, and culture results will be extracted from the patients' computerized file. Parameters to be evaluated before and after implementation of the program may include number of antibiotic days per patient, grams of antibiotic per patient per day, antibiotic expenditure per patient per day, total antibiotic expenditure per patient, length of stay per patient, and percent of antibiotic expenditure for piperacillin/tazobactam, linezolid, and imipenem-cilastatin combined.

Implementation of the program is ongoing. Results will be presented at Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Understand the process of program implementation and the role that pharmacists can play in a successful program.

Understand the impact of antibiotic stewardship practices in an academic medical center.

Self Assessment Questions:

Pharmacists can play a role in the implementation and execution of antibiotic stewardship programs. True or False

Antibiotic stewardship practices may help:
a)Optimize patient care
b)Reduce medication costs
c)Decrease antibiotic resistance
d)All of the above

DETERMINING THE EXTENT OF INTRAVENOUS MEDICATION INTERACTIONS AND INCOMPATIBILITIES IN INTENSIVE CARE PATIENTS

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Purpose: The number of medications administered via an intravenous route to patients in the intensive care areas greatly exceeds the number of medications administered via the same route to general medical/surgical inpatients. The number of intravenous medications may potentially be limited due to the lack of ability to gain intravenous access in the patient. This lack of access allows the opportunity for many medications to be infused via the same intravenous catheter by means of "piggy backing" and use of "Y-sites". While this opportunity allows the acute patient to receive their critical medications, it also provides the opportunity for drug interactions and incompatibilities which may lead to an eventual adverse event. With the growing establishment of critical care pharmacists and technology, many of these problems may be prevented; however, as seen by a recent publication, many critical care pharmacists are not staffed in hospitals 24 hours per day. Without the close monitoring of the acutely ill patient's intravenous medications, including the diluents and maintenance fluids, the opportunity for interactions and incompatibilities can increase. This study will determine the extent of drug interactions and incompatibilities of intravenous medications in patients receiving care in an intensive care unit.

Methods: The analysis will review a total of 240 patients over a one year period that received treatment in the surgical intensive care unit or medical intensive care unit in an academic medical center. Baseline demographics will compare patients' acuity, age, gender, length of stay in both intensive care unit stay and hospital, and discharge status. Data analysis will performed to determine the extent of drug interactions or incompatibilities between the patient's medications, medication diluent, and maintenance fluids.

Results: Study in progress

Learning Objectives:

To understand the reasons why medication incompatibilities and interactions can be easily overlooked in a critical care environment.

To determine the extent of medication interactions and incompatibilities in an intensive care area.

Self Assessment Questions:

What are some of the complications associated with intravenous drug incompatibilities?

Which medications have been shown to have the most interactions?

SPIRONOLACTONE FOR RESISTANT HYPERTENSION: FACTORS INFLUENCING TREATMENT OUTCOME

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Purpose:Spironolactone is not often used as an antihypertensive agent, yet it may be effective when patients fail to reach goal blood pressure. The questions of why some patients respond but others do not and how we can identify patients who will respond to spironolactone antihypertensive therapy still remain. Evidence suggests obesity may increase sympathetic nervous system activity and non-classical adrenal stimuli leading to inappropriately high plasma aldosterone levels and drug-resistant hypertension. Thus, patients with higher Body Mass Index (BMI) might receive the most benefit from spironolactone as an antihypertensive agent. The primary objective of this retrospective study is to determine if a relationship between BMI and effectiveness of spironolactone exists. The secondary endpoints include determining if spironolactone's efficacy in resistant hypertension is greater in patients on certain antihypertensive combinations or with certain comorbidities.

Methods:This study was approved by the Institutional Review Board. All William S. Middleton Veteran Affairs Medical Center patients with spironolactone prescriptions filled between 1/1/98 and 10/31/06 will be identified using a VISTA database search. Inclusion criteria are uncontrolled hypertension and a one to eight month follow-up after spironolactone initiation. Patients will be excluded if at the time of spironolactone initiation, a change was made to another antihypertensive agent simultaneously, a change was made prior to first follow up blood pressure documentation, spironolactone was prescribed for an indication other than hypertension, or the patient has a heart failure or cirrhosis with ascites diagnosis. Baseline data, defined as the data at the date of spironolactone initiation, and follow-up data, defined as next documented medical appointment with blood pressure reading, will be obtained. Regression analysis will be used to determine a correlation between blood pressure change and BMI.

Results/Conclusions:Results and conclusions will be presented at the Great Lakes Pharmacy Resident conference.

Learning Objectives:

Identify patient characteristics that may indicate a positive response to spironolactone antihypertensive therapy.

Compare antihypertensive agents that may indicate a positive response to the antihypertensive effects of spironolactone.

Self Assessment Questions:

Name a patient characteristic that identifies a probable candidate for spironolactone antihypertensive therapy.

Name one antihypertensive medication that may work well in conjunction with spironolactone.

BRIDGING THE GAP: MEDICATION RECONCILIATION IN THE INPATIENT AND OUTPATIENT SETTINGS USING AN ELECTRONIC DATABASE MAINTAINED BY PHARMACY TECHNICIANS.

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Statement of purpose: To assess the accuracy and utilization of the pharmacy technician sustained medication reconciliation database at Columbus Children's Hospital.

Statement of methods: Compliance with The Joint Commission's National Patient Safety Goal will be measured by random audits of patient records. An audit of the provider's use of the electronic database at clinic visits will measure the utility and convenience of the reconciled information. Incident report review and quality assurance checks by management will assess the accuracy of pharmacy technician maintenance of the database. As a measure of efficiency in updating the electronic database, the number of reconciled medications not entered within 48 hours over the course of a month will be evaluated.

Summary of results:
Providers access the medication list in the database 97% of the time for reconciling for patients for whom a medication list already exists. Complete reconciliation rates for admission and discharge in October 2006 were 94% and 71% respectively. Completed home medication lists on admission have increased from 84% to 91%. Similarly, outpatient reconciliation rates were approximately 91%. Pharmacy technician data entry accuracy is approximately 98%. Pharmacy technicians entered 80% of all medication reconciliation reports into the database within 24 hours of receipt. Finally, pharmacy technicians were able to enhance the surveillance of our medication use system by detecting near-misses.

Conclusions: The electronic database provides immediate access to current medication lists for providers and patients after each visit. Pharmacy technicians have knowledge of drug dosage forms which promotes a safe database maintenance system with error checking.

Learning Objectives:

Determine the potential impact of pharmacy technicians in the medication reconciliation process.

Evaluate the use of an electronic database for improving medication reconciliation and communication between providers.

Self Assessment Questions:

Pharmacy technicians with pediatric-specific drug dosage form knowledge provide a potential advantage in maintaining an accurate database. T/F

An electronic database provides an effective bridge the inpatient and outpatient environments for paperless medication reconciliation. T/F

COMPARISON OF ADVERSE EVENTS AND DOSING ERRORS FOR BIVALIRUDIN BEFORE AND AFTER STORAGE IN AUTOMATED DISPENSING MACHINES IN THE CATHETERIZATION LABORATORY.

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BACKGROUND: Unfractionated Heparin has long been the standard antithrombin treatment during procedures such as percutaneous coronary intervention (PCI). Bleeding complications are a limitation of heparin use in this setting. The direct thrombin inhibitor Angiomax (bivalirudin) was approved for clinical use in December 2000 as an alternative to heparin for patients with unstable angina during PCI.
Studies have shown the use of automated dispensing devices to be safe and decrease medication errors and adverse drug events in the hospital or health system pharmacy setting. At Parkview, in the past, orders for bivalirudin were called to the pharmacy as stat orders, and the pharmacy dispensed bivalirudin prior to infusion. Starting on June 28, 2006 bivalirudin was moved to automated dispensing machines in the cath lab where physicians now reconstitute and dilute bivalirudin. The purpose of this move was to save time and deliver the medication to the patient more quickly from the time the medication is ordered.
OBJECTIVE: The purpose of this project is to compare the frequency of medication errors, adverse events, and dosages of bivalirudin in patients undergoing PCI in the cath lab before and after the June 28, 2006 move of bivalirudin from the inpatient pharmacy to the cath lab.
METHODS: Data will be collected by means of a retrospective chart review from January, 2006 until June 28, 2006 when bivalirudin was dispensed by the pharmacy, and also from June 28, 2006 through December 2006, when bivalirudin was distributed via automated dispensing machines. The study will consist of patients undergoing PCI in the catheterization lab, including patients with coronary artery disease, unstable angina, myocardial infarction, congestive heart failure, chest pain, stent placement, and cardiac arrest. Patient demographics should be similar among treatment groups.
RESULTS/CONCLUSION: Data collection is in process. Results and conclusions of the study will be presented.

Learning Objectives:

Understand the role of bivalirudin in the catheterization laboratory.

Determine if bypassing the pharmacy to reconstitute/dilute bivalirudin in the catheterization lab is a safe process.

Self Assessment Questions:

Has bivalirudin been shown to be statistically not inferior to glycoprotein IIb/IIIa inhibitors plus heparin and associated with less bleeding complications in patients undergoing PCI? Yes/No

Did moving bivalirudin from the pharmacy to the automated dispensing machines in the Cath lab cause a significant increase in dosing errors or adverse drug events? Yes/No

EPIDEMIOLOGY AND TREATMENT CONSIDERATIONS OF COMMUNITY-ASSOCIATED METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS (CA-MRSA) INFECTIONS

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Purpose: Once considered to be an exclusively hospital-acquired infection, methicillin-resistant Staphylococcus aureus (MRSA) has recently been implicated in numerous patients without previously defined risk factors. Currently, there is no optimal treatment regimen or treatment guidelines available for the management of CA-MRSA infections. Drugs that have been recommended for the treatment of CA-MRSA infections include vancomycin, clindamycin, trimethoprim-sulfamethoxazole, and linezolid. Therefore, this research aims to fill a critical void in defining optimal treatment regimens for CA-MRSA infections by determining if a relationship exists between in vitro susceptibility results of CA-MRSA clinical isolates and the clinical and treatment course of patients with infections due to CA-MRSA. This information will allow clinicians to base their antibiotic decisions upon sound pharmacodynamic, microbiologic, and epidemiologic data.

Methods: Patients will be identified by microbiologic surveillance cultures at Wishard Health Services between January 1, 2006 and September 30, 2006. The medical records for each patient will be retrospectively reviewed to obtain details about the clinical course and treatment outcomes for each case, as well as to identify the study population using the CDC definition of CA-MRSA. A sampling of clinical CA-MRSA isolates will be tested for antimicrobial susceptibility utilizing the Etest methodology in order to obtain an exact MIC value for agents believed to be active against CA-MRSA. Using this information, we will determine if in vitro susceptibilities correlate with clinical cure rates. Furthermore, we will attempt to derive an evidence-based treatment course based upon the variables of epidemiology, pharmacodynamics, MIC determinations, and clinical cure.

Results and conclusions to be presented.

Learning Objectives:

Describe the differences in epidemiology between CA-MRSA and HA-MRSA

Be able to recognize the clinical features of infection with CA-MRSA, and design an appropriate treatment regimen for a patient with infection due to CA-MRSA.

Self Assessment Questions:

Define the 4 characteristics that must be met for a MRSA to be classified as CA-MRSA

List the therapeutic options for the inpatient or outpatient management of CA-MRSA infections.

SAFETY OF DEXAMETHASONE FOLLOWING CRANIOTOMY IN PATIENTS ON THE NEUROSURGICAL INTENSIVE CARE UNIT (NSICU)

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Objective: This research will assess the safety of short term post-operative dexamethasone following craniotomy and aneurysm clipping in patients on the neurosurgical intensive care unit at University of Illinois Medical Center at Chicago by comparing the rates of all infections including surgical site infection, urinary tract infections, pneumonia, bloodstream infections, and other infections in patients receiving dexamethasone versus a matched control group.

Methodology: This is a retrospective chart review of adults who underwent craniotomy and aneurysm clipping at UIMCC and were treated with short term dexamethasone following surgery. Patients will be matched by age, sex, and aneurysm type to controls that have also undergone craniotomy on the NSICU and have not received dexamethasone. Patients receiving dexamethasone for tumor or other disease state requiring long term steroid therapy such as spinal cord injury, septic shock, adrenal insufficiency, optic neuritis, and corticosteroid use at home will be excluded. The data collected will include age, gender, race, height, weight, vital signs, admitting diagnosis, indication for craniotomy, concurrent disease states and diagnosis, dose, route, duration of concomitant medications, dose, route, date, time and duration of dexamethasone, patient's lab values, cultures and sensitivities, operative reports (cerebral angiography and radiological tests), and procedure reports. Rates of all infections including surgical site infection, urinary tract infections, pneumonia, bloodstream infections, and other infections in patients receiving dexamethasone versus a matched control group will be compared. Any differences in average blood glucose levels in patients on the neurosurgical intensive care unit will be evaluated by comparing daily average blood glucose levels and insulin use in patients receiving dexamethasone versus a matched control group. Differences in length of stay in the ICU and mortality based on the use of dexamethasone post craniotomy in patients will also be evaluated.

Results and conclusions will be presented at the conference.

Learning Objectives:

Describe the postulated benefits of using dexamethasone following

craniotomy for elective aneurysm.
Interpret how dexamethasone use following craniotomy for elective aneurysm may impact the incidence of infection.

Self Assessment Questions:

What types of infection are most common in the NSICU?

By what mechanism might dexamethasone increase infection rate in post surgical patients.

ESTABLISHMENT OF A COLLABORATIVE ANTICOAGULATION MANAGEMENT SERVICE IN THE OUTPATIENT SETTING

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Purpose: To reduce anticoagulation related adverse events and increase patient compliance, while maintaining therapeutic efficacy through the development, implementation, and establishment of a pharmacist-managed outpatient clinic. A secondary objective is to develop and evaluate the clinic's therapeutic goals and protocols after implementation as part of the ongoing improvement process.

Methods: The objectives of the clinic will be met through the development of treatment algorithms, adverse event and clinical monitoring forms, a physician referral protocol/form, and service discharge protocols. Establishment of a timeline and formalized business plan will serve as guidance in the development and implementation process while multidisciplinary meetings identify overall expectations for services to be provided. Medicolegal aspects and statutes concerning collaborative practice within the state of Michigan as well as pharmacist reimbursement will be researched and utilized for clinic implementation. Information regarding the Federal Clinical Laboratory Improvement Amendments (CLIA) will also be obtained in order to provide point-of-care international normalized ratio (INR) testing. Anticoagulation services will be formally established after the appointment of a medical director who will delegate authority to the collaborating pharmacist and is responsible for clinic protocols. The collaborating pharmacist will initiate monitoring, INR testing, and adjust therapy according to protocols to comply with goals of the physician referral. Outcomes will be measured through assessment of pharmacist-managed anticoagulation dosing/monitoring, overall patient care, integration of the clinic within pharmacy services already provided, and expected future demand.

Results/Conclusion: Implementation of the clinic is still in progress. This presentation will include a detailed description of the establishment of a pharmacist-managed outpatient anticoagulation clinic, the multidisciplinary approach utilized, and integration into existing service lines. A proposal for assessment of patient outcomes to evaluate the safety and efficacy of the service will be presented as well.

Learning Objectives:

Create a plan for the design and implementation of a pharmacist-managed outpatient anticoagulation clinic.

Summarize the multidisciplinary involvement and resources necessary for clinic establishment and integration.

Self Assessment Questions:

What benefits are provided by pharmacist-managed anticoagulation clinics?

List methods utilized to overcome barriers encountered during the formation and establishment of a pharmacist-managed outpatient clinic.

PROVIDING EXPERIENTIAL LEARNING SITES FOR PHARMACY STUDENTS TO ENHANCE MEDICATION THERAPY MANAGEMENT (MTM) SKILLS

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Background: Medication Therapy Management (MTM) has been instituted by managed care on a variety of levels following the implementation of the Medicare Modernization Act (MMA). The Centers for Medicare and Medicaid Services (CMS) have yet to define requirements for MTM programs. A trend towards CMS requiring face-to-face MTM consultations from all Part D providers is emerging through a shared stance by the Medicare Rights Center and other groups including professional pharmacy organizations. The addition of face-to-face MTM services at the point-of-sale will modify the pharmacist's responsibilities in the workplace, forcing pharmacists to prepare for a change in the culture of pharmacy practice.
Purpose: This program will define a process of site creation in order to present an opportunity for pharmacy students to enhance their MTM skills through experiential learning and the practice of reimbursed face-to-face MTM consultations with eligible Medicare patients.
Methods: The experiential learning sites will be created by developing relationships between schools/colleges of pharmacy and Humana contracted pharmacies that currently provide face-to-face MTM services. A document describing how experiential learning directors may access Humana databases to find possible sites will be distributed to program participants. A call for participation issued in association with AACP was distributed to the schools/colleges of pharmacy to recruit participants. A survey will also be administered to create a curriculum for an MTM component of a standard community based advanced practice experience.
Results: The success of this program will be based on the response from the schools/colleges of pharmacy and the response from pharmacists wishing to provide face-to-face MTM services. Results of the survey will also provide insight to what curriculum is necessary to best prepare pharmacy students. Data collection is pending. Results and conclusions will be presented at the conference.

Learning Objectives:

Define a process in which MTM advanced practice experience sites may be created for schools of pharmacy.

Determine what aspects of face-to-face MTM consultations that pharmacy students require experience or training in prior to delivering the service themselves.

Self Assessment Questions:

CMS has defined minimum requirements of MTM programs to Medicare Part D providers. T/F

Survey results of experiential learning directors of schools of pharmacy have shown that pharmacy students may require further training and experience in what aspect(s) of face-to-face MTM consultation?

COMPARISON OF SIMPLIFIED DIGOXIN DOSING NOMOGRAM TO TRADITIONAL DOSING METHODS IN HEART FAILURE PATIENTS IN THE MODERN ERA: A PROSPECTIVE STUDY

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Background: Digoxin is a commonly prescribed medication for the treatment of heart failure (HF). Until recently, the standard of practice was to prescribe doses of digoxin to target serum digoxin concentrations (SDC) of 0.9 to 2.0 ng/mL. However, due to the results from recent post-hoc analyses of several large clinical trials, the recommended target for SDC is < 1.0 ng/mL in patients with HF. Previously, we developed a new, simplified digoxin dosing nomogram designed to achieve a target SDC between 0.5 - 0.9 ng/ml based on retrospective data.

Objective: The purpose of this study is to prospectively compare the effectiveness in achieving a target SDC between 0.5 - 0.9 ng/ml between our proposed digoxin dosing nomogram and standard dosing practices.

Methods: To assess the accuracy of the new digoxin dosing method, patients will be evaluated prospectively and compared to historical controls. All patients must be 21 years of age or older and must have a diagnosis of heart failure. Patients are excluded if they are pregnant, on hemodialysis, have unstable renal function, or taking other medications known to interact with digoxin. For the prospective arm, digoxin dose will be determined based upon a patient's ideal body weight and creatinine clearance using the proposed dosing nomogram. Steady-state SDC and creatinine will be assessed 2 - 4 weeks after initiation of digoxin. Patients in the historical control arm will identified from laboratory records of SDC measured between January 1, 2003 and August 31, 2006. Patients will be included if they meet the inclusion and exclusion criteria discussed above and the SDC was obtained at steady-state.

Results: In process of data collection

Learning Objectives:

Describe the current recommendations on therapeutic serum digoxin concentrations (SDC) for use in heart failure and explain the rationale for these recommendations.

Describe how to use the proposed digoxin dosing nomogram and our methods for evaluating its effectiveness.

Self Assessment Questions:

True/False: Post-hoc analysis of the DIG trial showed that heart failure patients with SDC =1.2 ng/ml had a 11.8% higher mortality and had higher rates of hospitalization and more incidences of digoxin toxicity than those treated with placebo.

True/False: The 2006 HFSA heart failure guidelines recommend target SDC of <1.0 ng/ml.

ASSESSMENT OF THE ANTIMICROBIAL TREATMENT OF HOSPITAL AND VENTILATOR ASSOCIATED PNEUMONIA AT A UNIVERSITY HOSPITAL.

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Purpose:
To quantify and evaluate the current antimicrobial treatment practices for hospital acquired/ventilator associated pneumonia (HAP/VAP) as compared to the American Thoracic Society/ Infectious Disease Society of America (IDSA/ATS) guidelines in an attempt to generate ideas for improvement within the institution.

Methods:
The design is a retrospective chart review. Patients with the diagnosis of HAP/VAP occurring after the guidelines were published are identified through the hospital's electronic medical records. Patients less than 18 years of age are excluded, as well as those with diagnosis of community acquired pneumonia. Empiric antimicrobial therapy is assessed for appropriateness as compared to the 2005 ATS/IDSA guidelines for HAP/VAP. In addition, the appropriateness of escalated/de-escalated therapy on the basis of microbiological and laboratory results is assessed. The patients are separated into two groups. The control group is those treated in accordance with the IDSA/ATS guidelines; the treatment group consists of those treated inappropriately per the guidelines. Inappropriate treatment is defined as inadequate antimicrobial spectrum, improper dosage of antibiotics, improper durations, and/or improper escalation or de-escalation of antibiotic treatment; all as recommended in the ATS/IDSA guidelines. Mortality rates, days spent in the intensive care unit, days spent in the hospital, incidence of secondary sepsis, incidence of secondary acute respiratory distress syndrome, time span between antibiotic order entry and administration, and adverse medication events will be recorded and compared between both groups.

Conclusions:
Enrollment methods have resulted in less than expected patient numbers. Therefore, different methods are being undertaken to seek out more patients for enrollment before analysis is to begin. Thus far, data is descriptive in nature. Once enough data is gathered, categorical data will be analyzed with a Chi-Squared test, while continuous data will be analyzed by an unpaired student's t-test. Results and conclusions will be presented at the conference.

Learning Objectives:

To be able to assess whether a patient has a hospital acquired versus community acquired pneumonia as well as a patient's risk for multi drug resistant bacterial pneumonia.

To be familiar with using the ATS/IDSA guidelines in choosing empiric treatment for HAP/VAP.

Self Assessment Questions:

The following are risk factors for multi-drug resistant HAP/VAP?
a.Hospitalized for at least 2 days in last 90 days
b.Pt requiring chronic dialysis visits
c.Residing in nursing home prior to admission
d.All of the above

A typical empiric antimicrobial regimen per the ATS/IDSA guidelines for HAP/VAP occurring after 5 days may look like:
a.Vancomycin + Cefepime + Aminoglycoside
b.Ceftriaxone + Azithromycin
c.Vancomycin + Cefepime + Aztreonam
d.Vancomycin + Imipenem
e.Levofloxacin

HIGH DOSE VS. STANDARD DOSE STATINS IN ACUTE CORONARY SYNDROME

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OBJECTIVE: 3-hydroxy-3-methylglytaryl coenzyme A reductase inhibitors (statins) have become part of the standard treatment for patients who have acute coronary syndrome (ACS). Statins have proven to be beneficial in ACS but the optimal dose has yet to be defined, as there has not been conclusive agreement among previous trials. As a result, many patients may be prescribed higher doses of statins regardless of LDL-C. In order to determine optimal dosing of statins in ACS patients, we will assess the rate of a composite endpoint in-hospital and at 6 months in patients with ACS receiving statin therapy.

METHODOLOGY: The Global Registry of Acute Coronary Syndromes (GRACE) is a large, prospective, multinational observation study of patients hospitalized with ACS. The University of Michigan Health System maintains a local portion of the GRACE database. All patients in this portion of the database who were prescribed a statin at discharge with 6 month follow up information will be included in this study. Data collection will include the patient's demographics, past medical history, medications prior to admission, type of statin and dose, diagnosis at presentation, and outcomes at discharge and 6 month follow up. Outcomes will be defined as a composite endpoint consisting of MI, re-hospitalization for heart disease, stroke, revascularization, and death. Prior to analysis, patients will be divided into a high dose group and a standard dose group. High dose therapy will be defined as the following medications: atorvastatin 80mg and 40 mg, simvastatin 80mg, rosuvastatin 40mg and 20mg. Also, any subject on verapamil, diltiazem, or amiodarone while concurrently taking atorvastatin 20mg, 10mg or simvastatin 40mg, 20mg, or 10mg will be included into the high dose group. All other doses will be considered standard dose.

RESULTS/CONCLUSIONS: Based upon the data collected, the authors will determine whether high dose or standard dose statins are appropriate in post ACS patients.

Learning Objectives:

Identify the results of landmark studies with statins in ACS patients.

Describe the difference in mortality, myocardial infarction, unstable angina and revascularization in patients on high dose vs. standard dose statins.

Self Assessment Questions:

True or False: Statins have become part of standard treatment for patients with ACS.

True or False: Mortality is significantly lower in patients on high dose statins in the University of Michigan's database of ACS patients.

EVALUATION OF THE CURRENT STATE OF PHARMACY INVOLVEMENT IN PEDIATRIC EMERGENCY PREPAREDNESS

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Despite major efforts in improving hospital and health-system emergency preparedness nationally since September 11, 2001, these efforts are generally directed toward adults and do not specifically address the unique needs of children. While hospital pharmacists can play an integral role in emergency preparedness, their current awareness of and involvement in pediatric emergency preparedness is unknown. The purpose of this study is to assess current emergency preparedness practices in stand-alone children's hospitals compared to other hospitals nationally and determine pharmacy's current efforts in pediatric emergency preparedness in these institutions.

The investigators first created and distributed a survey to the pharmacy directors of all 41 Owner Hospitals of the Child Health Corporation of America (CHCA). In addition to demographics, this survey inquired about several recommendations addressed in the 2003 ASHP Statement on the Role of Health-System Pharmacists in Emergency Preparedness, including respondent's knowledge of pharmacists' roles in the planning and execution of pharmaceutical distribution and control as well as drug therapy management of patients during disasters. It also inquired about current efforts demonstrated by the respondent's Pharmacy Department in emergency preparedness and more specifically in pediatric emergency preparedness. We are currently awaiting distribution of this survey to pharmacy directors from other hospitals nationwide to note significant similarities and differences in the responses between the two groups. Notable differences in the level of involvement in pediatric emergency preparedness between the stand-alone children's hospitals and the other hospitals that did not have as great a pediatric focus in patient care will be analyzed. Based solely on our findings from the survey of stand-alone children's hospitals, there is great need among health-system pharmacists for increased training and focus on pediatric issues in emergency preparedness. We hope to determine whether the same level of need exists in all hospitals based on the second survey.

Learning Objectives:

Discuss the intricacies of pediatric emergency preparedness as it relates to drug therapy

Determine the current trend in health-system pharmacist involvement in emergency preparedness planning and more specifically in pediatric emergency preparedness

Self Assessment Questions:

Name two instances where drug therapy management in emergency preparedness is different for a child than it is for an adult.

Name three types of disasters that hospitals typically prepare for through their emergency preparedness efforts.

HOW MANY RULES? RATIONAL DESIGN OF SMART PUMP DECISION SUPPORT.

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The process of drug library development has not been formally studied. The goal of this study is to determine how users of one manufacturer's smart infusion pump technology develop decision support to be used in their institutions, and to identify inter-institution variability in drug libraries. To accomplish this goal we intend to answer the following broad questions: What is the composition of the drug libraries in our study sample? What are the drug libraries' dynamics in our study sample? How has the smart infusion pump technology improved clinical practice in our study sample?

Investigators will survey up to 500 hospitals that are using one manufacturer's smart infusion pump technology. Data collected will include information about the characteristics of their drug library, including the following information: number of drugs included, name of the drugs, concentration, dosing ranges, limits and type of alerts (hard or soft), number of "personalities" (different data sets developed for distinct patient care areas), and how drugs are labeled in the system. Information on the process for drug library development (or initial programming), involvement of pharmacy and other disciplines, and the process for re-programming (additions, deletions, modification) will also be collected. Respondents will be asked to report how the decision support has affected clinical practice in the areas of efficiency, safety, and nurse medication administration practices.

Learning Objectives:

Understand the process for developing drug libraries as decision support for smart infusion pump technology.

Understand how decision support affects clinical practice.

Self Assessment Questions:

When referring to smart infusion pump technology, what is a personality?

What guardrails are offered by decision support for the administration of intravenous fluids and medications when utilizing smart pump technology?

THE IMPACT OF BRONCHIAL ALVEOLAR LAVAGE (BAL) ON MORTALITY IN CRITICALLY ILL PATIENTS WITH HOSPITAL ACQUIRED PNEUMONIA.

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Background: Critically ill patients are at an increased risk of developing hospital acquired pneumonia (HAP). The American Thoracic Society (ATS) has published guidelines for the management of adults with hospital-acquired, ventilator-associated, and healthcare-associated pneumonia. These guidelines have created a standard of practice for treating HAP. Obtaining microbiologic cultures of lower respiratory tract secretions in an effort to properly tailor antibiotic therapy is recommended. Antibiotics are frequently inappropriately used for the treatment of suspected pneumonia in intensive care units and this leads to increasing concern for the emergence of drug-resistant organisms, increased cost and increased antibiotic use.
Purpose: The purpose of the study is to evaluate whether the practice of obtaining a BAL compared to a sputum cultures or tracheal aspirate in patients with suspected HAP has an effect on mortality. This study will also assess and support which microbiologic strategy is associated with improved tailoring of antibiotics and improved outcomes in patients with HAP.
Methods: Critically ill patients with suspected HAP are currently being entered into a pneumonia database maintained through Microsoft Access by ICU pharmacists as part of a critical care quality improvement project. Patients are included into the ICU pneumonia database if empiric antibiotics for suspected HAP are initiated. This database will be reviewed for patients with BAL and sputum cultures during the study period. Once patients from the database are identified as being eligible for the study, mortality data will be collected along with various other secondary endpoints, including the total antibiotic days, length of ICU stay, microbiologic cure or failure, clinical cure or failure, duration of mechanical ventilation, and correlation of a clinical pulmonary infection score (CPIS) score to the total antibiotic days.
Results/Conclusions: Results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Discuss the importance of correctly diagnosing HAP in order to appropriately initial empiric antibiotic therapy.

Determine which method of obtaining microbiologic data (BAL versus sputum culture or tracheal aspirate) is associated better outcomes in patients with HAP.

Self Assessment Questions:

Tailoring antibiotics based on respiratory culture results leads to:
1.Decreased antibiotic use
2.Reduction in emergence of drug-resistant organisms
3.Decreased hospital costs
4.All of the above

True or False: The clinical pulmonary infection score (CPIS) is considered the "gold standard" when diagnosing HAP.

EARLY VERSUS LATE GLYCEMIC CONTROL AND MORBIDITY IN MEDICAL INTENSIVE CARE UNIT PATIENTS

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PURPOSE: The benefit of aggressive glycemic control has been documented in surgical intensive care unit (ICU) patients, but benefits in medical ICU patients remain controversial. We chose to compare the impact of early versus late glycemic control on clinical outcomes in medical ICU patients.

METHODS: Consecutive patients, 18 years of age and older who were admitted to the medical ICU were retrospectively reviewed. Patients with diabetic ketoacidosis and ICU length of stay (LOS) < 5 days, or a mean blood glucose level in the ICU > 180 mg/dl were excluded. Selected patients were stratified to early versus late glycemic control groups. Early and late glycemic control was defined as an initial 3-day mean blood glucose value less than and greater than 130 mg/dl, respectively. Clinical outcomes were compared between groups.

RESULTS: Twenty patients have been evaluated to date [early control, n=7; late control, n=13]. Patient demographics were similar between groups. The initial 3-day mean blood glucose in the early-control group compared to the late-control group was 114 13 mg/dl and 139 11 mg/dl ($p<0.001$), respectively. There was no difference in the mean blood glucose during the entire ICU stay for the early (120 17 mg/dl) versus late (123 10 mg/dl) groups ($p=0.682$). There were no differences in infection rates [14% vs. 46% ($p=0.329$)], use of prolonged antibiotics [14% vs. 23% ($p=1.00$)], need for a blood transfusion [29% vs. 31% ($p=1.00$)], ICU LOS [7 2 days vs. 10 4 days ($p=0.131$)] or hypoglycemia [0% vs. 15% ($p=0.521$)] in the early- versus late-control groups.

CONCLUSION: Based on preliminary data, early aggressive glucose control will not improve clinical outcomes in medical ICU patients. Goals for optimal glycemic control upon medical ICU admission require further study.

Learning Objectives:

Describe the benefit of tight glycemic control in the intensive care unit.

List complications associated with hyperglycemia in the ICU.

Self Assessment Questions:

True or False: Clinical trials have shown intensive insulin therapy to reduce morbidity in medical intensive care unit patients.

True or False: Intensive insulin therapy has been linked to improved survival in medical ICU patients.

EVALUATION OF GLYCEMIC CONTROL IN THE PEDIATRIC INTENSIVE CARE UNIT:
PRE AND POST IMPLEMENTATION OF THE GLUCOSTABILIZER INSULIN INFUSION PROGRAM

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PURPOSE:
Hyperglycemia and hypoglycemia are common in the intensive care unit (ICU) setting, and controlling these events has been shown to improve morbidity and reduce mortality in certain adult populations. Recently, a computerized insulin infusion program was introduced into the adult ICUs within our health system. This program allows caregivers to tightly control glucose management for patients requiring an insulin infusion. The program is currently being implemented in our pediatric ICUs. The purpose of this investigation is to evaluate the efficacy of glucose management during the first five days of admission to the PICU before and after program implementation.

METHODS:
A retrospective chart review will be conducted in two phases, pre and post implementation. For each phase, patients eighteen years of age and younger admitted to the PICU during a one-year period will be identified and studied. Those patients with blood glucose (BG) readings recorded will be included and randomized for review. Any patients less than five years of age, with a history of diabetes mellitus, with newly diagnosed diabetes mellitus, or those who did not have BG values recorded will be excluded. Identical criteria will be used to include and review patients for both groups. Also, patients on an insulin infusion in the pre group will be compared to those patients using the computerized insulin infusion program in the post group. Data collected will include: BG values, method of sample collection, insulin administration, length of stay (LOS), and mortality. The primary outcomes are the number of hyperglycemic and hypoglycemic events. Secondary outcomes include: PICU LOS, hospital LOS, mortality rates, and average BG over the first five days. Data will then be evaluated to determine morbidity and mortality trends affected by the initiation of the program.

RESULTS/CONCLUSIONS:
Pending based on completion of data collection and analysis.

Learning Objectives:

Explain the role of tight glycemic control in critically ill children.

Summarize the principles of the insulin infusion program and how the program affects the management of a patient's insulin regimen.

Self Assessment Questions:

Which of the following mechanisms has NOT been proposed to explain the association between hyperglycemia and poor outcomes during critical illness?
a.Increased inflammatory cytokine production
b.Acute dyslipidemia
c.Endothelial dysfunction
d.Hypercoagulation
e.All of the above have been proposed

True or False: As shown by the results from this study, use of the GlucoStabilizer is warranted in these PICU patients to help improve overall glucose management.
a.True
b.False

PERIPROCEDURAL PRESCRIBING PATTERNS IN THE BRIDIGING OF ENOXAPARIN WITH WARFARIN AT A VA HOSPITAL

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Background: Over 2 million patients in North America are on warfarin for the prevention of thromboembolism. The rationale for bridging anticoagulants is to minimize the time before and after a procedure that the patient is not receiving therapeutic anticoagulation, in turn, decreasing the risk of thromboembolism. When managing anticoagulation around an invasive procedure, one must consider the risk of thromboembolism if anticoagulation is discontinued, risk of bleeding from the procedure if anticoagulation is continued, and the safety and efficacy of alternative anticoagulant interventions. Current recommendations by the American College of Chest Physicians for managing anticoagulation during invasive procedures are based on observational studies, suggesting that individual patient profiles may lead to different choices and recommendations. The purpose of this study is to determine how patients at JBVAMC are being managed with warfarin and enoxaparin periprocedurally and the safety and efficacy of these regimens.

Methods: A six month retrospective chart review of patients on warfarin who were bridged with enoxaparin periprocedurally at JBVAMC from January to July 2006 will be performed. The medical chart will be reviewed and the following information will be collected; age, sex, weight, serum creatinine, hemoglobin, hematocrit, platelets, concomitant anticoagulant medications, indication for anticoagulation, date of last venous thromboembolism, prior cerebrovascular accident or transient ischemic attack. Preoperative and postoperative data will include times of administration and discontinuation of enoxaparin and warfarin, frequency and values of INRs and complete blood counts. Safety and efficacy data will include major bleeding defined as a hemoglobin decrease of >2gm/dL within a 24-hour period, intracranial, retroperitoneal, intraspinal, intraocular, pericardial, and/or bleeding requiring hospitalization, transfusion, or discontinuation of enoxaparin. Minor bleeding is defined as non-major bleeding requiring medical attention. Efficacy outcomes include incidence and type of thromboembolism.

Results: Data collection is ongoing. Results and conclusions will be presented at the conference.

Learning Objectives:

Evaluate current practice of bridging enoxaparin and warfarin in patients undergoing an invasive procedure.

Assess the safety and efficacy of enoxaparin and warfarin used concomitantly as bridge therapy.

Self Assessment Questions:

True/False: The current practice guidelines for periprocedural management of anticoagulation are based on the results of double-blind, placebo controlled clinical trials.

True/False: The methods used for bridging enoxaparin in patients on warfarin are well established and documented.

TREATMENT EFFICACY OF COMMUNITY ACQUIRED METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS

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Background: Recently, the frequency of healthy, immunocompetent adults presenting to hospitals/clinics with community acquired methicillin resistant Staphylococcus Aureus (CA-MRSA) has been increasing. Based on laboratory susceptibility testing, a number of oral antibiotics appear promising to treat CA-MRSA, although there is limited clinical data that documents these antibiotics' effectiveness. Clindamycin, doxycycline, and trimethoprim/sulfamethoxazole, are commonly reported as active against CA-MRSA isolates, have good oral absorption, and can be used in an outpatient basis.
Purpose: This study is a retrospective chart review which will determine the efficacies of different outpatient treatment regimens of CA-MRSA infections with surgical drainage alone and/or antibiotic therapy.
Methods: Patients who present to the Jesse Brown VA Medical Center between the dates of January 2003-July 2006 with suspected CA-MRSA infection will have their electronic medical record reviewed and the following data recorded: history of CA-MRSA or hospital aquired methicillin resistant Staphylococcus Aureus (HA-MRSA) infection/colonization, bacterial cultures, susceptibility pattern of MRSA, surgical drainage, antibiotic name, antibiotic dose, reasons for changes in antibiotic regimen, site of infection, type of infection, and physical exams. After the data is gathered, the following criteria for response or lack there of will be set up:
Success: complete resolution of signs and symptoms of infection
Failure: lack of any appreciable response to therapy
Partial response: resolution of some signs and symptoms
Delayed response: a successful response in a patient that was initially given an antibiotic ineffective against CA-MRSA who had their antibiotic changed to one that was effective against CA-MRSA after bacterial susceptibility testing
Apparent response: documented visit to either general medicine clinic or service which diagnosed initial infection with no mention of previously diagnosed infection (this visit must have occurred within 6 months of diagnosis)
Lost to follow-up: no evaluation up to 6 months after diagnosis of MRSA
Results/conclusions: Data collection is currently in process and will be presented at the Great Lakes conference.

Learning Objectives:

Discuss the differences between CA-MRSA and HA-MRSA.

Discuss the efficacies of different outpatient treatment regimens in treating CA-MRSA infections.

Self Assessment Questions:

What factors make CA-MRSA more virulent than HA-MRSA?

What antibiotics are effective in treating CA-MRSA infections?

SAFETY AND EFFECTIVENESS OF AN ELECTROLYTE REPLETION PROTOCOL IN SURGICAL INTENSIVE CARE PATIENTS

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Electrolyte homeostasis is essential for normal human physiologic function, including neurotransmission, energy formation (e.g., adenosine triphosphate), glycolysis, protein synthesis, blood coagulation, muscle contraction, and acid-base regulation. Severe electrolyte abnormalities may result in life-threatening complications such as arrhythmias, respiratory compromise, tetany, seizures, coma, and death. Multiple mechanisms may contribute to electrolyte abnormalities in critically ill patients. Correction of electrolyte abnormalities using a nurse-driven electrolyte repletion protocol is the local standard of care in the Surgical Intensive Care Unit (SICU) at The University Hospital.

The purposes of this single-center observational study are to evaluate the efficacy and safety of the nurse-driven multi-electrolyte (potassium, magnesium, phosphorous, and calcium) replacement protocol in maintaining electrolyte balance in patients admitted to the SICU. Data will be collected and analyzed for the following endpoints: 1) frequency of electrolyte concentration correction achieved within the first 24 hours following administration of a protocol-specific dose, i.e., dose-laboratory response relationship; 2) proportion of abnormal electrolyte concentrations over the patient-specific length of SICU stay; 3) adverse events during and 24 hours after electrolyte replacement, including supraphysiologic electrolyte concentrations; and 4) frequency of additional electrolyte replacements administered outside or in addition to the electrolyte replacement protocol. Adherence to the protocol (i.e., electrolyte dosage; frequency of administration) will be evaluated for all patients.

The significance of the study will be to determine if reeducation regarding the electrolyte replacement protocol is necessary and if revisions of the current electrolyte protocol are needed. Descriptive and comparative statistics will be employed to analyze the data, as appropriate. Data collection is currently in progress and analysis of the results is pending.

Learning Objectives:

Understand the importance of maintenance of physiologic electrolyte concentrations.

Discuss the consequences of subphysiologic electrolyte concentrations in critically ill patients.

Self Assessment Questions:

Use of a nurse-driven electrolyte replacement protocol has been shown to be as effective as physician-driven electrolyte replacement. True/False

Phosphate replacement has been shown to improve diaphragm function in patients with respiratory failure. True/False

PHARMACISTS' PERCEPTIONS OF PAIN MANAGEMENT ISSUES IN THE COMMUNITY PHARMACY

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PURPOSE: To determine pharmacists' knowledge and skills in helping patients manage their pain; to identify factors that correlate with pharmacists' perceptions toward pain management and concerns pharmacists may have about providing effective pain management; and to identify if pharmacists' attitudes differ toward helping patients manage chronic non-malignant pain versus malignant pain.

METHODS: A web-based survey will be sent via e-mail to all approximately 900 pharmacies inviting all licensed pharmacists to complete the survey. Analysis of the data will look at how knowledgeable and effective pharmacists feel about their role in pain management. The results of the survey will be analyzed to determine which factors (e.g. full-or part-time status, highest degree attained, number of years as a practicing pharmacist, and region of the country in which they practice) correlate with pharmacists' attitudes toward pain management. Respondents will be asked to mark which factors (e.g. inadequate knowledge of pain management, prescribing practices by physicians, fear of patient addiction, federal or state regulations, reimbursement issues, or fear of robbery) are considered when providing effective pain management services.

RESULTS: The survey will be e-mailed to the pharmacies in mid-January with data collection and analysis to occur in February. Results will be presented at the 2007 Great Lakes Pharmacy Residency Conference.

CONCLUSIONS: The results from this study will help to develop a needs-analysis that may be utilized to create a community pharmacy-based pain management program. If pharmacists feel knowledgeable and effective in providing pain management services, then it is likely that a pain management program could be implemented with pharmacist support. However, if pharmacists do not feel knowledgeable or effective in providing pain management services, then it is likely that pharmacists would need further education about pain management and associated misconceptions before a pain management program may be implemented.

Learning Objectives:

Identify health care system, patient, and health care professional barriers to effective pain management.

Describe methods in which pharmacists can play a significant role in pain management.

Self Assessment Questions:

Which of the following is not a patient-related barrier to effective pain management?
A. Fear of addiction
B. Concern about potential side-effects
C. Beliefs related to their ethical or cultural background
D. Concern about distracting their physician from other treatments
E. All of the above are patient-related barriers to effective pain management

True or False. Since most pharmacists do not have the authority to prescribe, there is little they can do to effectively manage their patients' pain.

ASSESSMENT OF PHARMACY STUDENTS' AWARENESS OF CAREER OPPORTUNITIES IN THE PHARMACEUTICAL INDUSTRY

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Background: Most pharmacy graduates pursue a career in retail and hospital settings and overlook the pharmaceutical industry as a potential career option. In part, this may be due to the limited exposure of pharmacy students to training and career opportunities in the pharmaceutical industry.

Purpose: The primary objective of this study is to assess pharmacy students' awareness of and exposure to career opportunities in the pharmaceutical industry. Secondary objectives will be to determine pharmacy students' sources of information about career options in industry, perceptions of whether or not these sources of information are sufficient, and interest in learning about or pursuing careers in the pharmaceutical industry.

Methods: An online survey will be developed and administered via email to all pharmacy students attending two local pharmacy schools, Butler University College of Pharmacy and Health Sciences and Purdue University School of Pharmacy and Pharmaceutical Sciences. The survey will collect data to examine students' exposure to and familiarity with career opportunities in the pharmaceutical industry, sources of information about career options in industry, and interest in a job position in the pharmaceutical industry. All data will be recorded anonymously without student identifiers to maintain confidentiality. The survey data will be compiled, analyzed, and presented using descriptive statistics. Results will also be evaluated through potential subgroup analyses such as year in pharmacy school, previous work experience in industry, or completion of an elective industry course.

Results/Conclusions: Results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference. The results of this study have the potential to impact the university and industry setting and will be used to determine if improvement in pharmacy students' exposure to training and career options in the pharmaceutical industry is warranted.

Learning Objectives:

Evaluate pharmacy students' awareness of and exposure to career opportunities in the pharmaceutical industry.

Determine pharmacy students' sources of information on career opportunities in the pharmaceutical industry and perceptions of whether or not these sources of information are sufficient.

Self Assessment Questions:

True or False: Pharmacy students are interested in learning more about career opportunities in the pharmaceutical industry.

True or False: Pharmacy students have a good understanding of career opportunities in the pharmaceutical industry.

IMPACT OF MEDICARE PART D MEDICATION COVERAGE ON HIGH BLOOD PRESSURE CONTROL IN INNER CITY SENIORS

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Purpose: Medicare Part D is an outpatient prescription medication benefit program that became available to the 42.6 million Medicare beneficiaries on January 1, 2006. Prescription medication insurance may be important for a disease state such as hypertension where medication adherence is an essential part of hypertension management. Moreover, hypertension control is important for prevention of complications from the disease. Therefore, access to prescription medication insurance may be essential to appropriately manage hypertension. Our Aim is to determine if Medicare Part D has allowed seniors better access to prescription medications, and if so, if this translates to better blood pressure control.

Methods: Patients presenting for an office visit at the Rosa Parks Geriatric Clinic were screened to identify those with Medicare Part D coverage and no prior prescription medication coverage. Qualifying patients were administered a survey relating to their experiences with Medicare Part D and prescription medication coverage. Chart review was performed to obtain blood pressure readings from clinic visits 6 months prior to and after initiation of Medicare Part D coverage. Each patient's outpatient pharmacy records were obtained and reviewed for antihypertensive medication fill history. The primary endpoint is to assess any change in adherence to antihypertensive medications by comparing refill history 6 months prior to and after initiation of Medicare Part D coverage. Secondary endpoints include mean systolic and diastolic blood pressure 6 months prior to and after initiation of Medicare Part D, and survey response indicating patient experience with Medicare Part D. This study has been approved by the Institutional Review Board and informed consent was obtained for all subjects.

Results/Conclusions: The results and conclusions of this study will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Discuss the impact that adherence to antihypertensive medication has on the control of blood pressure.

Explain if prescription medication insurance influences adherence.

Self Assessment Questions:

T or F: Studies have shown that seniors without prescription drug insurance coverage have no difference in rate of forgone medication use than those with coverage.

T or F: Adherence to medication is essential to manage hypertension and prevents complications for patients who remain above goal blood pressure after lifestyle modifications.

RETROSPECTIVE CHART REVIEW GUIDED ASSESSMENT OF THE STATISTICAL AND CLINICAL SIGNIFICANCE OF SELECT WARFARIN DRUG-DRUG INTERACTIONS

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Purpose:

Warfarin is a vitamin K antagonist used for mid to long term anticoagulation. It has a narrow therapeutic index and many proposed drug-drug interactions. Studies to evaluate these interactions are missing or conflicting. The purpose of this study is to evaluate the presence, timing and significance of interactions seen between warfarin and short courses of "additive therapy" such as ciprofloxacin, trimethoprim/sulfamethoxazole, azithromycin and prednisone.

Methods:

A retrospective chart review will be performed for 1/01/2005 through 12/31/2005 to identify warfarin patients started on "additive therapy". Inclusion criteria will be: outpatients, ages 18 to 99 years, stable INR and warfarin dose, at least 1 INR drawn within 30 days after additive therapy, additive therapy of 3 days or greater and prior warfarin therapy for at least six months. The exclusion criteria will be additive therapy of greater than 21 days, initiation of further medications during or up to 30 days after additive therapy and self-reported changes in vitamin K or ethanol intake. The following data will be collected on all patients: age, gender, current alcohol consumption, changes in alcohol consumption, INR goal, two INRs before treatment, all INRs collected during and up to 30 days after additive therapy, pre- and post- therapy warfarin doses, preemptive warfarin dose changes, name, dose and duration of additive therapy, and any noted thromboembolic or bleeding complications during or within 30 days of additive therapy. The INR effect of each additive therapy will be compared to that of terazosin (for the same time period), a medication with no proposed warfarin interaction. When significant drug-drug interactions are observed, the monitoring for each patient will be assessed in an attempt to recommend standardized monitoring or dosage adjustment necessary for each medication if appropriate.

Preliminary results: Data collection in progress

Conclusion: Data collection in progress

Learning Objectives:

Describe the method and importance of monitoring warfarin therapy.

Describe the interactions between warfarin and each additive therapy.

Self Assessment Questions:

What is an INR and what are the possible complications associated with sub- and supra-therapeutic INRs?

In what direction (if at all) should a patient's warfarin dose be preemptively changed when initiating short course sulfamethoxazole/trimethoprim (Bactrim)?

EVALUATION AND STANDARDIZATION OF THE DISCHARGE MEDICATION RECONCILIATION PROCESS AT THE UNIVERSITY OF LOUISVILLE HOSPITAL (ULH)

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Purpose: Medication reconciliation includes the comparison of a patient's home medications to those ordered during hospitalization. Historically, there have been long-standing problems within the discharge process to include incorrect and/or incomplete discharge medication information, perceived lack of time by hospital personnel, and lack of patient involvement. The purpose of this project was to develop a standardized method to provide medication reconciliation at discharge and to ensure compliance with Joint Commission for Accreditation of Healthcare Organizations standards and the 2006 National Patient Safety Goals.

Methods: A retrospective review of 100 patient charts was performed to determine current documentation practices at the time of discharge. Hospital staff were educated on standardized methods/forms to conduct discharge medication reconciliation and patients were provided with a medication safety pamphlet and a Universal Medication Form on which they were instructed to list their home medications. Various public education efforts on the importance of knowing and understanding home medications were conducted.

Results: Eighty-one patients were discharged from ULH during the study period with an average of 4.1 medications. Discharge orders were unable to be located for 6 patients. Sixteen percent of patients were instructed to "resume home medications" at the time of discharge. Universally, documentation was not consistent or complete at the point of discharge.

Conclusion: Documentation surrounding the discharge process at ULH is inadequate. The need for a systematic, uniform discharge form and process is evident. Healthcare professionals and community members have been receptive to educational events that encourage home medication knowledge and understanding by patients. Community education is essential for successful implementation of medication reconciliation in the hospital setting.

Learning Objectives:

Understand why a multidisciplinary team is required to successfully perform medication reconciliation at discharge

Understand effective methods for educating the public on the importance of knowing and understanding the use of their home medications

Self Assessment Questions:

Which of the following is not a reason why medication reconciliation at discharge may be difficult to perform?
Incorrect and/or incomplete discharge medication information
Perceived lack of time by hospital personnel
Lack of patient involvement
None of the above

Which of the following is/are effective methods for educating the public on the importance of knowing and understanding the use of their home medications?
Brown Bag events
Speaking at Senior Citizen Centers
Providing information at Ambulatory Care Clinics
All of the above

EFFECTS ON THE SCREENING AND MONITORING OF METABOLIC COMPLICATIONS FROM ATYPICAL ANTIPSYCHOTICS AFTER IMPLEMENTATION OF AN ORDERING TEMPLATE

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Purpose: Atypical antipsychotics have improved the treatment of many psychiatric diseases; however these medications are linked to elevated cholesterol, diabetes and weight gain. In 2003, consensus guidelines for monitoring of metabolic adverse effects were developed. The objective of this study is to determine if a new ordering template for atypical antipsychotics increases the number of patients who receive appropriate baseline and 12 week monitoring for metabolic side effects.

Methodology:This study was approved by the Institution Review Board. We included the following atypical antipsychotics: clozapine, risperidone, quetiapine, olanzapine, aripiprazole, and ziprasidone. Recommended monitoring parameters for these medications include blood pressure, body mass index (BMI), fasting plasma glucose, and fasting lipid profile at baseline and 12 weeks after initiation. Appropriate monitoring was defined as meeting 3 out of 4 of the previously mentioned parameters. The ordering template was implemented in December 2005 for atypical antipsychotics as the William S Middleton VA. This template reminds providers of the monitoring criteria, shows the patient's most recent labs, and allows them to order appropriate labs directly from the template. We will use our health system's computerized medical record to identify patients who have begun atypical antipsychotics after implementation of the ordering template. The following data will be collected: age in years; gender; ethnicity; psychiatric diagnoses; atypical antipsychotic agent initiated; BMI; fasting glucose and/or hemoglobin A1c; fasting lipid profile; blood pressure; hyperlipidemic medications; smoking history; and current antihypertensive medications. All patient data will be recorded without patient identifiers to maintain confidentially. The primary outcome is percentage of patients who receive appropriate monitoring of metabolic parameters at baseline and 12 weeks. A previous study looked at the same primary outcome prior to initiation of the template. Groups will be compared using a chi-squared test. Results and conclusions of this study will be presented at the conference.

Learning Objectives:

Describe the appropriate monitoring parameters for metabolic syndrome associated with the use of atypical antipsychotics.

List the criteria for metabolic syndrome diagnosis.

Self Assessment Questions:

List the top two atypical antipsychotics most associated with weight gain.

Atypical antipsychotics offer what benefit over first generation antipsychotics.

COMPARISON OF GAMUNEX (IVIG-C) TO CARIMUNE (IVIG) AND CYTOGAM (CMVIG) IN KIDNEY TRANSPLANT DESENSITIZATION

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BACKGROUND: Between 2000 and 2004, the U.S. Renal Data System reports that nearly 500,000 patients were diagnosed with end stage renal disease. These patients are generally treated with dialysis, but kidney transplantation is the preferred treatment. Unfortunately, kidney donations are inadequate due to significant shortages in availability. Complicating this situation, many patients are unable to receive transplantations because of a positive cross-match and/or prior sensitization from pregnancy, blood transfusions, or previous transplants. Historically pre-transplant cross-matching has been used as the standard to predict transplant rejection. A positive cross-match would result in a contraindication to transplantation. Advances have been made in desensitizing patients and creating a negative cross-match prior to surgery using plasmapharesis, immunosuppressives, and immunoadsorption. Despite these therapies, overall graft survival has remained relatively low. Recently, the addition of intravenous immunoglobulin (IVIG) has provided improvement to overall treatment success. In transplantation, IVIG appears to suppress the immune response through antibody neutralization and inhibition of T- and B-cell proliferation. Currently, multiple IVIG formulations are available for treatment. Unfortunately, sucrose-containing products have been associated with acute renal toxicity. Gamunex is a novel formulation that is sucrose-free and has not been associated with nephrotoxicity. The purpose of this study is to analyze if Gamunex is both safe and effective for kidney transplant desensitization.

METHODS: Prior to data collection, approval from the institutional review board will be obtained. A retrospective chart review, from November 2003 to January 2007, will be performed on all kidney transplant patients receiving Gamunex, Carimune, or Cytogam for desensitization. The Health System's Information Warehouse will be used to identify such patients. Patients will be included in the review if they are least 18 years of age. Pregnant women, prisoners, and mentally challenged individuals will be excluded.

RESULTS/CONCLUSIONS: Results and conclusion of this study will be presented at the conference.

Learning Objectives:

Describe the potential barriers to transplantation in patients with end stage renal disease and discuss some of the potential treatments to reduce these barriers

Describe the difference in outcomes between patients receiving Gamunex, Carimune, and Cytogam for transplant desensitization.

Self Assessment Questions:

True or False. Of the six FDA approved indications for IVIG, only one formulation has received approval for all six.

True or False. Intravenous immunoglobulin can enhance as well as suppress the immune response

PEDIATRIC PHARMACIST IN AN EMERGENCY DEPARTMENT

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Purpose: To identify the potential roles and effectiveness of staffing a pharmacist in emergency department (ED) and level 1 trauma center of a pediatric hospital.

Methods: Currently in the ED, codes are staffed by the central pharmacist, traumas are staffed by the pharmacist covering the two general medical floors, and all other pharmacy services are provided by the central pharmacy staff. A two month pilot, conducted from January 4, 2007 through February 26, 2007, is being utilized to assess the roles and effectiveness of pharmacist presence in a pediatric ED. The pilot has a pharmacist staffed in the emergency department Thursday through Monday from 3pm to 11pm. During this time the pharmacist is responsible for medication order entry for medication doses given in the ED that are not available in MedSelect, clarifying order interventions when needed, responding to drug information questions, and participation, as the second pharmacist, in codes and traumas that occur in the ED. During the pilot, drug information questions are tracked as type of question and length of time required to appropriately answer the question and order interventions are tracked as type and number of interventions. Codes and traumas are also being tracked as number of occurrences in which there is pharmacist participation. Prior to the pilot, the reported number of drug information questions called down to central pharmacy as well as the number of order entries for doses requiring preparation in the central pharmacy were tracked per shift for three months. This data was used for pilot shift confirmation and to serve as baseline information to help determine the effectiveness of and need for an ED pharmacist. A post-pilot survey will be offered to the second shift ED staff to help assess the overall results and effectiveness of the pilot.

Results: Data collection is ongoing. Results will be announced at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Show the need for pharmacy services in the emergency department of a pediatric hospital.

Identify the areas in which pharmacy services can improve patient care and safety in the emergency department.

Self Assessment Questions:

T or F - Pharmacist presence in the emergency department can help increase quality of care and patient safety?

T or F - The post pilot survey showed the effectiveness of a pharmacist in the ED.

ASSESSING GERIATRIC PERCEPTION OF EXUBERA, AN INHALED INSULIN.

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Objective: Many patients are reluctant to initiate insulin therapy. The purpose of this study is to assess whether there is a patient perceived stigma associated with insulin use in a community based geriatric population and if orally inhaled insulin shares the same psychological implications.

Methodology: A survey was designed to assess patient perception of injected and inhaled insulin. The survey was developed in conjunction with clinical faculty members. The face validity of the survey was tested and a pilot test was performed. Patient demographics, as well as diabetes severity and previous medical management for diabetes were also included. The sample population includes non insulin dependent diabetic patients seen in the previous six months at a pharmacist-run diabetes clinic in an internal medicine office. Surveys will be completed in the office before a diabetes appointment. Survey questions will be analyzed for reliability using Cronbach's alpha. Survey responses will be analyzed using descriptive statistics. The survey outcome may allow a better understanding of geriatric perception of insulin and if inhaled insulin would be a viable treatment option in patients reluctant to start insulin therapy. Results to follow.

Learning Objectives:

Identify the barriers associated with insulin initiation.

Discuss previous research with psychological insulin resistance.

Self Assessment Questions:

T/F 75% of patients have a fear of daily injections.

List the seven areas of psychological insulin resistance.

EVALUATION OF AN INPATIENT VENOUS THROMBOEMBOLISM PROPHYLAXIS PRESCRIBING TOOL IMPLEMENTED AT A VA HOSPITAL

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Statement of Purpose: Hospital stays and procedures performed during hospitalization put patients at risk for developing venous thromboembolism (VTE) and serious complications. However, it is known that appropriate use of prophylactic medications can prevent VTE, thereby decreasing morbidity and mortality. To this end, and in accordance with the CHEST guidelines for VTE prophylaxis published in 2004, an inpatient guided prescribing tool was implemented at the Wm. S. Middleton Memorial Veterans Hospital, Madison, WI in June of 2005. This tool is intended to increase appropriate prescribing of medications used for VTE prophylaxis, and ultimately, to decrease the incidence of VTE. The objectives of this study are; 1) to examine changes in prescribing trends of prophylactic medications after implementation of the prescribing tool, and 2) to examine appropriate use of the tool by evaluating cases where patients were not placed on prophylactic medications.

Statement of Methods: A retrospective chart review will be performed. Changes in prescribing trends will be assessed by comparing the proportion of patients with orders written for prophylactic medications from 7/1/03 to 6/30/04 versus 7/1/05 to 6/30/06. Appropriate use of the tool will be assessed by reviewing incidences where providers selected, "the patient is already anticoagulated or has no risk factors," or "prophylaxis is contraindicated," and chose not to prescribe prophylactic medications. Charts will be reviewed to determine the appropriateness of these selections and if these patients developed VTE.

Summary of Results: To be presented at the conference

Conclusions: To be presented at the conference

Learning Objectives:

Describe the effects of an inpatient guided prescribing tool on trends in prescribing prophylactic medications.

Discuss factors which may lead providers to choose not to prescribe prophylactic medications.

Self Assessment Questions:

What percent change in prescribing of prophylactic medications was noted after implementation of the prescribing tool?

What percent of patients not prescribed prophylactic medications may have been eligible to receive these therapies?

PHARMACIST INTERVENTIONS TO MINIMIZE CHANGES TO COMPUTERIZED PHYSICIAN ORDERS DURING VERIFICATION

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Background: Computerized physician order entry (CPOE) is a process by which physicians enter medication orders electronically. These orders are subsequently verified by pharmacists for appropriateness. To date, less than 10% of hospitals have implemented CPOE. At two other institutions with CPOE, pharmacists reported that during the verification of CPOE orders, problems arose with inconsistency, duplication, and retiming of orders. At Evanston Northwestern Healthcare (ENH), an integrated electronic health record with CPOE from EPIC Systems Corporation was implemented in March 2003. Issues with dose, frequency, comments, and product selected in CPOE orders prompted pharmacist to alter about one-third of CPOE orders during verification in 2004. Each manipulation of the order by pharmacists introduces an opportunity for error; therefore minimizing these manipulations became a priority. Following some system modifications, verification changes were reduced to 22% of orders by the end of 2005.

Purpose: The purpose of this study is to describe the most common changes pharmacist make on computerized physician orders during verification and determine the impact of system modifications and pharmacist education on the number of CPOE orders altered by pharmacists.

Methods:
CPOE orders were evaluated by the investigators and the ENH Pharmacy Superuser Committee to determine interventions which can be implemented to reduce the number of changes pharmacists are making during verification. The interventions consisted of system modifications and pharmacist education. A comparison of pre-implementation and post-implementation data will be performed to assess the difference in the percentage of CPOE orders modified.

Results/Conclusions:
Data collection is in progress. Results and conclusions will be presented at the conference.

Learning Objectives:

To identify the most common changes pharmacists are making on CPOE orders during verification.

Describe those interventions which resulted in reduction in verify changes

Self Assessment Questions:

CPOE eliminates need for pharmacists to manipulate orders during verification. T/F

The most common change pharmacists make during verification is related to start time. T/F

EFFECT OF MEDICATION RECONCILIATION ON THE INAPPROPRIATE USE OF STRESS ULCER PROPHYLAXIS UPON DISCHARGE FROM AN INTENSIVE CARE UNIT

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BACKGROUND AND PURPOSE: While medication reconciliation (MR) intends to limit errors of transcription, omission, duplicate therapy, and unnecessary treatment, its effects on inappropriate stress ulcer prophylaxis (SUP) are largely unknown. The primary objective of this study was to determine the effect of MR on the incidence of inappropriate SUP upon transfer from an intensive care unit (ICU) to a non-ICU setting and at hospital discharge. As a secondary objective, complications related to acid suppressive therapy in those patients who did and did not have SUP appropriately discontinued were evaluated.

METHODS: A retrospective before-and-after study was performed of patients who were admitted to the ICU and had SUP initiated. Patients with acid suppressive therapy prior to ICU admission, a documented gastrointestinal bleed, or those who expired were excluded. Appropriate use of SUP was defined using evidence based guidelines developed by the American Society of Health- System Pharmacists. Appropriate use of SUP was assessed upon transfer from the ICU to a non-ICU setting and at hospital discharge. Results were compared between pre-MR and post-MR groups.

RESULTS: Preliminary data of 29 (pre-MR, n = 21; post-MR, n = 8) surgical ICU patients were evaluated. There was no difference in the use of inappropriate SUP upon transfer from the ICU to a non-ICU setting in the pre-MR and post-MR groups, respectively (86% [18/21] vs. 75% [6/8], p = 0.597). Similarly, there was no difference in the use of inappropriate SUP upon hospital discharge in the pre-MR and post-MR groups, respectively (15% [3/20] vs. 40% [2/5], p = 0.252). One patient who received inappropriate SUP upon ICU discharge developed a complication.

CONCLUSIONS: MR will not decrease the incidence of inappropriate SUP upon transfer from ICU or at hospital discharge.

Learning Objectives:

1. Determine what patient populations will most likely benefit from stress ulcer prophylaxis.

2. List risk factors for stress-related mucosal damage.

Self Assessment Questions:

True/False Non-intensive care unit patients are at high risk for developing stress-related mucosal damage.

Which of the following risk factors warrant stress ulcer prophylaxis?
A. Atrial Fibrillation
B. Coagulopathy
C. Cellulitis
D. Mechanical Ventilation
E. B and D

IMPACT OF EMPIRIC TREATMENT GUIDELINES ON ANTIBIOTIC PRESCRIBING IN ADULT ONCOLOGY PATIENTS WITH FEBRILE NEUTROPENIA

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Background:
The Infectious Diseases Society of America (IDSA) publishes generalized guidelines describing recommended antimicrobial use in patients with febrile neutropenia. Clinical observation at Akron General Medical Center (AGMC) suggests multiple regimens for this diagnosis have included piperacillin/tazobactam, gentamicin, and vancomycin. Additionally, empiric gentamicin and vancomycin doses lacked consideration of patient weight and renal function. AGMC, therefore, has recently developed institutional guidelines for empiric treatment of febrile neutropenia based on IDSA guidelines, AGMC organism susceptibility patterns, medication formulary, product availability, and cost. Pre-printed order forms were developed to include antibiotics, doses, and intervals recommended for both penicillin and non-penicillin allergic patients.

Purpose:
The purpose of this study is to determine if newly implemented guidelines at AGMC for empiric treatment of febrile neutropenia increases selection of ceftazidime and improves initial dosing of gentamicin and vancomycin.

Methods:
An evaluative, retrospective chart review will be conducted to identify patients with a diagnosis code for neutropenia through ICD-9 coding. Adult oncology patients (>18 years of age) presenting to AGMC with a documented diagnosis of febrile neutropenia prior to (August 2005 - September 14, 2006) and following (November 2006 - March 2007) guideline implementation will be included. The primary endpoints of this study will compare the before and after guideline percentages of ceftazidime prescribed and gentamicin and vancomycin dosed according to the AGMC guidelines. The secondary endpoint will compare the percentage of piperacillin/tazobactam initially prescribed pre- and post-guideline implementation. Statistical tests, including chi-square test of homogeneity and one-tailed z-test, will be used to compare initial antibiotic selection and dosing before implementation of institutional guidelines to after.

Results/Conclusions:
The results and conclusions of this study will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Discuss the options for empiric treatment of febrile neutropenia in an adult oncology patient at AGMC.

Explain the results and conclusion of the study and how it applies to clinical practice.

Self Assessment Questions:

For an adult oncology patient, without a documented penicillin allergy, presenting with neutropenic fever at AGMC, which of the following empiric antibiotic regimens is recommended:
a.Amphotericin B monotherapy
b.Ceftazidime, Gentamicin, +/- Vancomycin
c.Ciprofloxacin and Gentamicin
d.Vancomycin monotherapy

T/F: Institutional guidelines and pre-printed order forms can improve antibiotic selection and dosing at AGMC.

EVALUATION OF SURGICAL THERAPY IN THE TREATMENT OF INFECTIVE ENDOCARDITIS

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Purpose: The study will attempt to evaluate the use of surgery in the treatment of infective endocarditis at an urban tertiary teaching hospital, including indication for surgery and outcome. These data will help guide selection of patients who may benefit from surgical management in the treatment of infective endocarditis.

Methods: Reports were generated for patients admitted to Detroit Receiving Hospital between January 2003 and December 2006 based on their diagnosis related groupings. A retrospective chart review was conducted for any patient with diagnosis related groupings that included endocarditis. Patients were excluded if they did not have confirmation of valvular vegetation by a transthoracic echocardiogram or a transesophageal echocardiogram, had no microbiological evidence of organism causing infective endocarditis, or did not receive appropriate antimicrobial treatment for infective endocarditis. Data collected include: risk factors for endocarditis, patient demographics, cultures and sensitivity, transthoracic or transesophageal echocardiogram results, valve affected, presence or absence of valvular prosthesis, type of surgery performed, antimicrobial therapy, concomitant infections that required treatment, complications of endocarditis, duration of bacteremia or fungemia, duration of antimicrobial therapy, discharge antibiotics, and clinical outcome.

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

Learning Objectives:

List the most common indications for surgical treatment of infective endocarditis.

Describe typical treatment modalities for Staphylococcus aureus endocarditis.

Self Assessment Questions:

When is medical treatment alone inadequate for the treatment of infective endocarditis?
a. Tricuspid valve endocarditis without systemic complications
b. Mitral valve fungal endocarditis
c. Mitral valve endocarditis with perforation of valve
d. B and C

True or False. Heart failure caused by infective endocarditis and uncontrolled by medical management is an indication for surgery.

ASSESSING THE EFFECT OF NUMBER OF ORGAN FAILURES, TIMING OF INITIATION, AND APACHE II SCORE ON PATIENT OUTCOMES WITH DROTRECOGIN ALFA (ACTIVATED) USE IN A COMMUNITY HOSPITAL SETTING

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BACKGROUND: Drotrecogin alfa (activated) was approved in 2001 for the treatment of adult patients with severe sepsis who have a high risk of death (defined by APACHE II score = 25 or multi-organ failure) based on the PROWESS trial. There is strong data to support its use in patients with multi-organ failure but, it is controversial to use it in patients with single organ failure based on the ADDRESS trial. In addition, the timing of its administration may be crucial for optimal outcomes. Some preliminary data from PROWESS, ENHANCE and MERCURY studies suggest that drotrecogin alfa (activated) given within 24 hours of onset of sepsis-induced organ dysfunction may be associated with improved survival. Lastly, it is debatable if APACHE II score can be used as a practical tool to identify appropriate drotrecogin alfa (activated) candidates.
PURPOSE: To assess the effect of number of organ failures, timing of initiation and APACHE II score on patient outcomes with drotrecogin alfa (activated) use.
METHODS: A retrospective chart review was conducted for all the patients who received drotrecogin alfa (activated) from June 2004 through October 2006 at Community Health Network. The primary end points of the project are to assess the effect of the following parameters on patient outcomes including (1) Number of organ failures (one vs. multiple) (2) Timing of initiation (= 24 hours vs. > 24 hours from the onset of organ dysfunction) (3) APACHE II score (= 25 vs. < 25). Patient outcomes are measured by 28-day all-cause mortality, length of ICU stay and hospital stay, and discharge dispositions. The secondary end points include (1) The appropriateness of use in patients who did not finish the 96-hour course of therapy and their outcomes; (2) Adverse events.
Results and Conclusion: Chart reviews are in process and results are pending.

Learning Objectives:

Compare PROWESS to ADDRESS trial and describe the controversy in the use of drotrecogin alfa (activated) in patients with single vs. multiple organ failure.

Compare and contrast the preliminary data that have suggested that the timing of drotrocogin alfa (activated) initiation may be crucial for optimal patient outcomes.

Self Assessment Questions:

T/F The results of the ADDRESS trial concluded that drotrecogin alfa (activated) should not be used in adult patients with severe sepsis who are at low risk of death (defined by APACHE II score <25 or single organ failure) due to the absence of a beneficial treatment effect and an increased incidence of serious bleeding complications.

T/F Available preliminary data suggested that drotrecogin alfa (activated) given within 24 hours of onset of sepsis-induced organ dysfunction were associated with improved patient outcomes.