EPIDEMIOLOGICAL EVALUATION OF BACTEREMIAS IN THE BURN AND SURGICAL INTENSIVE CARE UNITS

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Background:
Antimicrobial resistance is a growing problem in intensive care units (ICUs) today. Infections in critically ill patients with antimicrobial-resistant pathogens can cause significant morbidity and mortality. Each year, almost 2 million patients acquire a nosocomial infection. About 90,000 patients die as a result of their infection. Resistance to antimicrobials is a major concern with more than 70% of bacteria causing nosocomial infections being resistant to at least one of the drugs most commonly used. Identifying common pathogens and patterns of antimicrobial resistance in critically ill patients is important to provide optimal care to these patients.

Purpose:
Evaluate the epidemiology of bacteremias in both the burn and surgical ICUs.

Methods:
This Institutional Review Board-approved retrospective study included patients ≥ 18 years of age, admitted to the burn or surgical ICU, and had a bacteremia between January 1, 2000 to June 30, 2009. Patients were excluded if pregnant, or had a hospital stay less than 72 hours. Baseline data included age, gender, race, baseline laboratory data, percent total body surface area (TBSA) burns, acute physiology and chronic health evaluation (APACHE) II score, Charlson Comorbidity Index Score, and sequential organ failure assessment (SOFA) score. Clinical and microbiological data collected include date and time blood cultures were obtained, source of bacteremia, risk factors associated with bacteremia, concomitant infections, antimicrobial regimen administered, date and time to first antimicrobial dose, and in vitro susceptibilities to antimicrobial agents. Outcomes evaluated include hospital and ICU length-of-stay and in-hospital mortality. Additionally, evaluation of the susceptibility of these bacteremias are assessed.

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

Learning Objectives:

Identify changing antimicrobial resistance patterns at our institution.

Discuss outcomes associated with empiric and appropriate antimicrobial selection and time to appropriate antimicrobial therapy in patients with bacteremias.

Self Assessment Questions:

What is/are risk factor(s) for developing an infection with a multi-drug resistant organism?
a)Current hospitalization of 5 days or more
b)Residence in a nursing home or extended-care facility
c)Patient receiving chronic dialysis
d)All of the above

What measures can be taken to help prevent the development of catheter-associated bloodstream infections in patients?
a)Perform hand-hygiene before catheter insertion or manipulation
b)Avoid using the femoral vein for central venous access
c)Use an all-inclusive catheter cart or kit
d)All of the above

COMPARISON OF VANCOMYCIN LOADING DOSES VERSUS EVERY EIGHT HOUR DOSING IN THE EMERGENCY DEPARTMENT IN ADULT SUBJECTS WITH NORMAL RENAL FUNCTION TO ACHIEVE THERAPEUTIC TROUGH CONCENTRATIONS

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Purpose:
Studies suggest that vancomycin trough concentrations (VTC) less than 10 mcg/mL have the potential to induce resistance. Recommendations to help quickly achieve target VTC are to administer 20-30 mg/kg loading doses or decreasing the dosing interval. Due to the concerns of inducing resistance with subtherapeutic VTC and the delay in achieving appropriate target levels, the purpose of this study is to evaluate vancomycin loading doses (ranging from 20-25 mg/kg) versus initiating an eight hour dosing interval in the Emergency Department (ED) at Advocate Christ Medical Center (ACMC) to achieve an initial target VTC of greater than or equal to 10 mcg/mL.

Methods:
This is a prospective, observational study from January 2010 to April 2010. Subjects presenting to the ED at ACMC with an order for vancomycin will be dosed by the ED pharmacists. Inclusion criteria include: subjects 18 to 50 years old, creatinine clearance (CrCL) greater than or equal to 60 mL/min on presentation, and actual body weight (ABW) greater than or equal to 40 kg. Subjects with prior use of vancomycin within the past week, diagnosis of febrile neutropenia, meningitis, or endocarditis will be excluded from the study. Subjects meeting inclusion criteria will be randomized to receive an initial loading dose of vancomycin based on ABW or initiated on an every eight-hour dosing interval. For subjects receiving a loading dose, continuation of vancomycin will follow the current protocol at ACMC in which subsequent doses will be calculated based on the Rodvold method and given every 12 hours. For subjects receiving the decreased dosing interval, the total daily dose will be calculated based on the Rodvold method and divided into three doses given every eight hours. The initial VTC will be drawn 30 minutes prior to the third dose. All data will be maintained confidentially.

Results:
In Progress

Learning Objectives:

Recognize the concerns of subtherapeutic vancomycin trough concentrations.

Recommend an appropriate vancomycin regimen for young, healthy adult patients.

Self Assessment Questions:

Which of the following is not a concern of subtherapeutic VTC?
a)Resistance
b)Toxicity
c)Delay in achieving target levels
d)All of the above
e)None of the above

True or False. A vancomycin loading dose of 20mg/kg is the recommended starting regimen for young, healthy adult patients.

IDENTIFICATION OF THE CAUSES OF MEDICATION ERRORS IN INPATIENTS INFECTED WITH THE HUMAN IMMUNODEFICIENCY VIRUS (HIV)

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Purpose: High levels of medication adherence to antiretrovirals are imperative. Previous studies have proven that HIV infected patients are at a great risk for medication errors in regards to their antiretroviral regimens when they are hospitalized. The objectives of this study were to identify the types of medication errors involving antiretrovirals at Henry Ford Hospital in Detroit, MI, evaluate where in the medication use process the errors occurred and identify contributing factors in order to implement corrections to the medication use system.

Methods: This retrospective chart review included any patient taking at least one antiretroviral medication as an inpatient between July 1, 2008 and July 1, 2009, with the first 50 patients at least 18 years old, with a confirmed HIV diagnosis, and who had been admitted for at least 24 hours included and pregnant patients exluded. The National Coordinating Council on Medication Error Reporting (NCCMERP) taxonomy was used to record types of errors incurred, node in the medication use process where the error occurred (prescribing, transcribing, dispensing or administration), and contributing factors. Data was analyzed using descriptive statistics.

Results: A total of 116 errors were identified. Drug omissions accounted for 16.4% of the errors, dose omissions for 9.5%, improper dose for 9.5%, wrong frequency for 6.9%, wrong drug for 17.2%, wrong time for 25.9%, monitoring errors for 14.7%. 56% were prescribing errors, 28.4% were dispensing errors, 15.5% were administration errors and there were no transcribing errors. Examples of contributing factors included knowledge deficits, performance deficits and computer programming errors.

Conclusions: These results prove that medication errors involving antiretrovirals occur with high frequency and are possible at different nodes of the drug use process for various reasons. These results will be used to identify system based changes that could prevent the errors from occurring in future admissions of HIV infected inpatients.

Learning Objectives:

Discuss the types of errors that occur regarding antiretroviral medications in HIV infected inpatients both globally and at Henry Ford Hospital.

Identify where in the drug use process these errors occurred and why.

Self Assessment Questions:

Based on published data, what errors are most common in patients on antiretroviral therapy?

Based on Henry Ford Hospital data, which errors were most common and where in the drug use process were these errors occurring?

TRIPLE BLOCKADE OF THE RENIN ANGIOTENSIN ALDOSTERONE SYSTEM IN DIABETIC (TYPE 1 & 2) PROTEINURIC PATIENTS

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Background/Purpose:
Reductions in albuminuria have been shown to slow the progression of diabetic nephropathy. Patients with diabetic nephropathy that are treated with maximal doses of Angiotensin Converting Enzyme Inhibitors (ACE-I) and Angiotensin II Receptor Blockers (ARB) may present with persistent albuminuria reflecting further Renin Angiotensin Aldosterone System (RAAS) activation. This increased RAAS activation can lead to microvascular renal disease which may be more effectively treated with triple RAAS blockade by the addition of a direct renin inhibitor, aliskiren. This will allow a more complete suppression of circulating aldosterone and further control blood pressure.

Methods:
This will be a 6 week prospective open-label trial consisting of 2 groups with early diabetic nephropathy defined by a glomerular filtration rate (GFR) >60 ml/min calculated using the Modification of Diet in Renal Disease equation. Patients included will be between the ages of 18-80 with either type 1 or 2 diabetes, blood pressure <130/80 mmHg at the time of enrollment, stable on maximal doses of an ARB (valsartan 320mg daily or 160mg BID) and ACE-I (enalapril 40mg daily or 20mg BID) and with albuminuria. Group 1 represents patients with macroalbuminuria (≥ 300mg/g), and Group 2 patients with microalbuminuria (30-299mg/g). Patients will be excluded if they have the following: GFR < 60 ml/min; serum potassium >5 mg/dl; pregnancy; history of angioedema; history of ACE-I induced cough; hypersensitivity to aliskiren; or HbA1c >9%. Once consent is obtained, the patient will participate in a screening visit with physical exam performed by a physician, measuring vital signs, and baseline labs. In addition to the home medication regimen, the patient will receive aliskiren 150mg daily for 2 weeks, followed by aliskiren 300mg daily for 4 weeks. The goal will be to recruit 30 patients, 15 in each group.

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

Learning Objectives:

Recognize the importance of decreasing albuminuria in patients with diabetic nephropathy.

Identify the recruitment challenges at county hospitals like John H. Stroger Jr. Hospital.

Self Assessment Questions:

Which of the following is NOT an adverse effect of aliskiren?
a)Hyperkalemia
b)Hypertension
c)Hypotension
d)All of the above

True or False. Diabetic nephropathy can only occur in patients with type 2 diabetes

EFFECT OF COMPUTERIZED PRESCRIBER ORDER ENTRY ON PHARMACIST INTERVENTIONS DURING MEDICATION RECONCILIATION AT ADMISSION AND DISCHARGE

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Purpose: Pharmacists at the University of Wisconsin Hospital and Clinics (UWHC) have been responsible for the inpatient medication reconciliation process since the 1970s. Several studies have previously been completed at UWHC evaluating the number of interventions performed by pharmacists at admission and discharge prior to computerized prescriber order entry (CPOE) implementation in March 2008. The purpose of this study is to evaluate the number and types of interventions made by pharmacists after CPOE implementation, and compare this to pre-CPOE data.

Methods: Pharmacists that work on four services (Medicine, Surgery, Transplant and Pediatrics) will be asked to record the number and types of interventions that they make at admission and discharge on each patient for a 10-day period. Interventions that will be recorded include omitted medications, incorrect dose, medication, schedule or route, duplicate medications or therapeutic interchanges made and patient allergies to ordered medications. The estimated time on making these interventions will also be recorded as well as acceptance rate by prescribers of pharmacist recommendations. Information collected will be compared to data collected by previous studies prior to implementation of CPOE.

Results: Data collection will occur in early February, and will be compiled for presentation at the Great Lakes Pharmacy Residency Conference in April.

Learning Objectives:

Describe the impact of CPOE on the number and type of pharmacist interventions made during medication reconciliation during admission and discharge.

List the three most common interventions that pharmacists made by pharmacists at admission or discharge following CPOE intervention

Self Assessment Questions:

What are the three most common interventions made by pharmacists following CPOE implementation at admission? At discharge?

Do pharmacists spend more time on medication reconciliation at admission and discharge prior to CPOE implementation or after implementation?

ASSESSMENT OF PATIENT OUTCOMES AFTER THE IMPLEMENTATION OF A PHARMACIST-COORDINATED LIPID SHARED MEDICAL APPOINTMENT (LIPID SMA) WITHIN THE PRIMARY CARE CLINIC AT A VETERANS AFFAIRS HOSPITAL

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Purpose: Cardiovascular disease (CVD) remains the number one cause of death in the United States. Among lipids, elevated low-density lipoprotein cholesterol (LDL-C) has been clearly demonstrated to be independently associated with increased coronary heart disease (CHD) risk. The latest guidelines from the National Cholesterol Education Program Adult Treatment Panel III (NCEP ATP III) continue to identify LDL-C as the primary target for cholesterol-lowering therapy. In the fall of 2007, the Louis Stokes Cleveland VA Medical Center (LSCVAMC), Wade Park Division in Cleveland, OH implemented a Lipid Shared Medical Appointment (Lipid SMA) clinic. The Lipid SMA targets patients with elevated LDL-C which has not responded to usual care provided by their primary care provider. The primary objective of this study is to test the null hypothesis that there is no difference in the percentage of patients who achieve their LDL-C goal in the pharmacist-coordinated Lipid SMA versus usual care provided by other health care practitioners in the same setting.

Methods: Retrospective chart review of patients age 18-89 years of age with LDL-C goal of 100 mg/dL or less determined according to NCEP ATP III guideline who received lipid management in the LSCVAMC pharmacist-coordinated Lipid SMA or by a primary care provider other than a clinical pharmacist between January 1, 2008 and April 1, 2009. The primary outcome of this study is the percent of patients who attained LDL-C goal in the Lipid SMA group compared with the usual care group. Charts will be randomly reviewed by selecting every other patient listed for each group until 80 patients are deemed appropriate for each study group (160 total subjects) according to the defined inclusion and exclusion criteria.

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

Learning Objectives:

Recognize variables that contribute to the success of a pharmacist-coordinated Lipid SMA in managing patients with dyslipidemia

Evaluate whether LDL-C goals are better achieved if the patients are followed by a clinically trained pharmacist in a Lipid SMA

Self Assessment Questions:

True/False- The latest NCEP ATP III guidelines continues to identify LDL-C as the primary target for cholesterol-lowering therapy.

True/False- Dyslipidemia management provided by a clinically trained pharmacist in a Lipid SMA reduced time to achieve LDL-C goals in this study.

DEVELOPING AND IMPLEMENTING STANDARDIZED DOSING OF ACETAMINOPHEN AND IBUPROFEN FOR PEDIATRIC INPATIENTS

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PURPOSE: Medication errors are a concern in all patient populations but can be especially harmful in the pediatric population. When prescribing and administering acetaminophen and ibuprofen a weight-based dose may be miscalculated or an incorrect dose may be drawn up for administration. Current prescribing practices at Toledo Childrens Hospital often do not take into consideration how doses will be delivered based on commercially available dosage forms. This often results in prescribed doses that are not measurable. The purpose of this study is to develop and implement standardized dosing of acetaminophen and ibuprofen to decrease medication errors and utilize commercially available dosage forms.

METHODS: Data was collected retrospectively from October 1, 2009 through November 30, 2009 for patients prescribed acetaminophen and ibuprofen in order to evaluate current prescribing practices. Collected data included patient demographics, medication, dose, route, frequency, indication for use, and dosage form utilized for administration. Current prescribing of acetaminophen and ibuprofen was evaluated to identify if doses were prescribed appropriately based on weight and if they can be provided by commercially available dosage forms. Standardized weight-based dosing ranges will be determined based on current milligram per kilogram dosing recommendations. This information will be used to implement standardized dosing, allowing medications to be provided in the appropriate unit of use. A preprinted order set or dosing guideline table will be prepared for use by practitioners.

PRELIMINARY RESULTS: Data has been analyzed for thirty-eight patients and fifty total medication orders. Forty-two of the fifty orders were acetaminophen orders and the remaining eight were for ibuprofen. Of those medication orders, fourteen (27%) were not measurable as prescribed. The majority of the non-measureable orders (93%) were for acetaminophen.

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

Learning Objectives:

Discuss the issues associated with practitioner prescribing of acetaminophen and ibuprofen in the inpatient setting.

Describe the benefits of implementing standardized dosing.

Self Assessment Questions:

In which of the following strengths is acetaminophen commercially available as a suppository?
a.40 mg
b.80 mg
c.160 mg
d.240 mg

True/False: The appropriate weight-based dose of acetaminophen is 5-10 mg/kg/dose.

IMPLEMENTATION OF AN ANTIMICROBIAL STEWARDSHIP PROGRAM

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BACKGROUND: Inappropriate use of antimicrobial agents is prevalent, leading to unnecessary health care costs, resistance development and patient exposure to medication. Studies also correlated an increase in resistant bacteria with the increase in antibiotic usage. Two factors that have been shown to improve outcomes, and decrease resistance, the incidence of secondary infections, and healthcare costs are appropriate antimicrobial use and infection control measures.
Antimicrobial stewardship guidelines established by the Infectious Diseases Society of America (IDSA) and the Society for Healthcare Epidemiology of America (SHEA) aim to improve appropriate antimicrobial use by facilitating appropriate selection, dosing, route of administration and duration of therapy in order to improve clinical outcomes and decrease unwanted effects of antimicrobial use.
OBJECTIVE: To measure the effectiveness of the quality improvement initiative regarding antimicrobial appropriateness by comparing data before and after the implementation of an antimicrobial stewardship program.
METHODS: Patients greater than 18 years of age at Mercy St. Charles Hospital receiving cefepime, daptomycin, imipenem/cilastatin, or piperacillin/tazobactam admitted between October 1 and December 31, 2008 were included in the retrospective chart review before program implementation and those admitted between October 1 and December 31, 2009 were included in the prospective review during program implementation. The program consists of daily patient monitoring with recommendations made to physicians regarding timely intravenous (IV) to oral (PO) route changes, renal function dose adjustments and de-escalation or cessation of therapy for empiric and directed treatment regimens. The results are then reviewed for appropriateness based on the following: appropriate empiric therapy, appropriate dose, antibiotics discontinued after three days of a negative work-up, antibiotics changed/de-escalated within 24 hours of culture and sensitivity results and antibiotics converted from IV to PO dosing when the patient is eligible.
RESULTS/CONCLUSIONS: Data collection is in progress. Results and conclusions will be presented at the Great Lakes Conference.

Learning Objectives:

Recognize the importance and necessity of antimicrobial stewardship

Identify key areas involved in antimicrobial stewardship that can benefit the patient and the hospital by decreasing unnecessary drug exposures, resistant bacterial strains, and hospital costs.

Self Assessment Questions:

Which of the following is/are important to monitor in an antimicrobial stewardship program?
a. Timing of IV to PO conversion
b. De-escalation of antibiotics based on culture and sensitivity reports
c. Empiric therapy selection
d. A and C
e. All of the above

Running a successful antimicrobial stewardship program can lead to:
a. Decreasing unnecessary drug exposures
b. Increasing resistant bacterial strains
c. Decreasing hospital costs
d. A and C
e. All of the above

CHANGES IN PRESCRIBING PATTERNS AFTER THE PUBLICATION OF LITERATURE DESCRIBING A POTENTIAL INTERACTION BETWEEN CLOPIDOGREL AND PROTON PUMP INHIBITORS

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Purpose: Emerging data suggest a potential drug interaction between PPIs and clopidogrel that decreases clopidogrel effectiveness and increases the risk of adverse cardiovascular events. This study evaluates the effect of recent literature describing this interaction on prescribing patterns. The primary objective is to compare the frequency of ACS patients discharged from a community teaching hospital with prescriptions for both clopidogrel and a PPI before and after these publications. The secondary objective is to identify the frequency of ACS patients prescribed a PPI upon discharge with no indication for PPI use.

Methods: This retrospective observational study identified patients with ICD9 codes for acute myocardial infarction (410.xx) and unstable angina (411.xx) discharged between December 2008 - February 2009 and July 2009 - September 2009 and prescribed clopidogrel at discharge. The first time period includes prescribing data that occurred before the publications while the second time period includes prescribing data after the publications. Data was collected using electronic medical record discharge summaries. Descriptive statistics and chi-square were used for statistical analysis. Before initiation, the institutional review board approved the study.

Results: In total, 290 charts were reviewed and 114 met inclusion criteria. Prior to the publication of data describing the potential drug interaction, 30.6% of patients were prescribed both clopidogrel and a PPI at discharge compared to 32.3% of patients after publication of the data (P=0.847). In the first time period, 73.3% of patients prescribed a PPI did not have an approved indication compared to 85.7% in the second time period (P=0.418).

Conclusions: During the two time periods under investigation, there was no statistically significant difference seen in prescribing patterns in response to recent publications describing a potential drug interaction between clopidogrel and PPIs. Additionally, there was no significant difference in the frequency of patients prescribed a PPI without an appropriate indication.

Learning Objectives:

Discuss the current literature describing the interaction between clopidogrel and PPIs

Describe the proposed mechanism of the drug interaction between clopidogrel and PPIs

Self Assessment Questions:

True/false: The proposed drug interaction between clopidogrel and PPIs is supported by evidence from randomized, placebo-controlled trials.

The FDA has recommended against using which of the following PPIs concomitantly with clopidogrel?

A. Pantoprazole
B. Omeprazole
C. Lansoprazole
D. Rebeprazole

EVALUATION OF THE MEDICATION RECONCILIATION PROCESS AFTER THE IMPLEMENTATION RX HISTORY CAPTURE

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Background:
It has been estimated that 46% of medication errors occur on admission or discharge when new orders are written. Since 2005, The Joint Commission has been dedicated to preventing medication errors by establishing a National Patient Safety Goal on medication reconciliation. Standard Registers Rx History Capture is designed to allow facilities to electronically access a patients prescription medication history. Once implemented, a clinician is able to query a patients prescription data from SureScript-RxHubs information network and the hospitals own health information systems to generate a list of prescription medications.

Purpose:
The purpose of this study is to evaluate the impact of Rx History Capture on the medication reconciliation process and to determine if access to patients prescription medication history will improve the accuracy of medication reconciliation.

Methods:
Completed medication reconciliation forms were collected for patients admitted into a large community teaching hospital for a period of two weeks. Forms were categorized as completed, completed with interruption or not completed. A pharmacist recorded the start time of the process when the electronic tracking board changed a patients status to admitted or anticipated admission. The stop time was recorded when the pharmacist signed and dated/timed the medication reconciliation form. The patient interview was standardized to decrease variability between pharmacists. Medication reconciliation forms were then collected for a period of two weeks with the assistance of Rx History Capture. Implementation of Rx History Capture was approximately one month. Pharmacists training was approximately one week. The primary outcome was improvement of medication reconciliation form completion. Secondary outcomes were increased time to completion of a medication history interview, increased quality of medication history interviews, improved transfer of home medications to the discharge instructions, and pharmacist acceptance of Rx History Capture.

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

Learning Objectives:

Describe the medication reconciliation process and its significance in patient care.

Recognize the impact of electronic data sources in the medication reconciliation process.

Self Assessment Questions:

Identify the primary function of Rx History Capture.

Identify the requirements of The Joint Commissions National Patient Safety Goal 8 - Accurately and completely reconcile medications across the continuum of care.

CLINICAL CHARACTERISTICS TO PREDICT ADVERSE EVENTS WITH LOOP DIURETIC INFUSIONS IN PATIENTS WITH ACUTE DECOMPENSATED HEART FAILURE

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Intravenous loop diuretics are a mainstay in the treatment of acute decompensated heart failure (ADHF) patients with volume overload. While intermittent intravenous loop diuretics have been the conventional method of administration, studies have shown that continuous diuretic infusions may be a more safe and efficacious method of fluid removal. The purpose of this study is to determine unique predictors of adverse effects associated with continuous infusion in patients with ADHF; and to establish a conversion factor to an effective oral loop diuretic maintenance dose following completion of the continuous infusion.

This is a single-center, retrospective case control study that has been IRB-approved. All patients admitted to UMHS with ADHF between January 2006 and June 2009 receiving continuous loop diuretic infusions were included. Patients with incomplete records, infusion for less than 24 hours, concomitant nephrotoxins or dialysis, and those less than 18 years of age were excluded.

This study will compare two patient groups, those with and without adverse events. Adverse events include acute renal failure, ototoxicity, hypotension, hypokalemia, hypomagnesemia, hyponatremia, arrhythmias, ICD shocks, myalgias, gout, and contraction alkalosis. In order to carry out this comparison, baseline characteristics will be collected from individual electronic patient medical charts including demographics, heart failure characteristics, relevant medications, co-morbidities, and daily net fluid status. To establish an effective oral loop diuretic maintenance dose after completion of a loop diuretic continuous infusion, a correlation will be made between the loop diuretic dose received over the final 24 hours of continuous infusion, the first post-infusion dose, and the corresponding urine outputs for each.

After completion of this research, we hope to be able to distinguish patient characteristics that increase the likelihood of adverse events from loop infusions and identify the effective loop diuretic oral maintenance dose at the completion of a loop diuretic infusion.

Learning Objectives:

Discuss the benefits of continuous loop diuretic infusions vs. intermittent bolus injections.

Identify potential adverse effects associated with loop diuretic infusions.

Self Assessment Questions:

What is the benefit of continuous loop diuretic infusions over intermittent bolus injections?
A.Safety
B.Effectiveness
C.Reduced fluctuations of intravascular volume
D.All of the above

Which of the following is an adverse effect associated with loop diuretic use?
A.Hyperkalemia
B.Hypernatremia
C.Myalgias
D.Hypermagnesemia

EVALUATION OF A VANCOMYCIN DOSING PROTOCOL IN THE NEONATAL INTENSIVE CARE UNIT

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Background
Vancomycin is an antimicrobial agent used to treat gram-positive infections, including those caused by methicillin-resistant Staphylococcus aureus (MRSA) in neonates and infants. Serum vancomycin trough concentrations are used as a surrogate marker to determine efficacy of vancomycin dosing and may also help evaluate vancomycin clearance. Consistent with recently published consensus guidelines recommending serum trough concentrations of 15-20 mcg/ml in adults, target serum trough concentrations of 15-20 mcg/ml are also frequently used in the neonatal population, although no studies have correlated clinical efficacy. At Northwestern Memorial Hospital (NMH), recommendations for initial vancomycin doses for neonates are 20 mg/kg and goal serum trough concentrations are 10-20 mcg/mL. To date, no previous studies have evaluated vancomycin dosing regimens in neonates at NMH and it is unknown if the current dosing regimen consistently achieves desired serum trough concentrations. The purpose of this study was to determine if the current vancomycin empiric dosing methodology in the neonatal intensive care unit (NICU) is appropriate to achieve adequate serum trough concentrations.

Methods:
This investigation was a retrospective cohort study evaluating vancomycin dosing in the NICU at NMH. Criteria for inclusion was any patient admitted to the NICU between October 2007 through December 2009 who received at least two doses of vancomycin and had at least one vancomycin serum trough concentration in the electronic medical record. Other data variables collected included: gestational age, renal function, length of vancomycin therapy and desired serum trough concentration. The primary endpoint was the fraction of initial vancomycin dosing regimens that achieved desired serum trough concentrations in the study population. Secondary endpoints included any changes in renal function while on vancomycin therapy.

Results/Conclusions:
Data collection and analysis is currently underway. Results and conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:

Understand the physiologic differences in the neonatal population versus adults

Identify how physiologic differences can affect the dosing of vancomycin in the neonatal population.

Self Assessment Questions:

In both neonates and adults what is the surrogate marker that is used to determined clinical efficacy of vancomycin?
a)Trough concentrations
b)Peak concentrations
c)Serum Creatinine

What is the best predictor of clearance of vancomycin in the neonatal population?
a)Weight
b)Gestational age
c)Postnatal age
d)Postmenstrual age

EVALUATION OF TREATMENT ALGORITHM FOR ANTICOAGULANT-ASSOCIATED INTRACEREBRAL HEMORRHAGE

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Purpose/Background:
The incidence of anticoagulant-associated intracerebral hemorrhage (AAICH) has increased dramatically over the past two decades. In 2007, the American Heart Association/American Stroke Association published guidelines for the treatment of spontaneous intracerebral hemorrhage. The Ohio State University Medical Center (OSUMC) Stroke Team, in conjunction with the Department of Neurosurgery, developed an institutional guideline for the treatment of intracerebral hemorrhage (ICH). The guideline includes recommendations for making the diagnosis, managing increased intracranial pressure and hypertension, DVT prophylaxis, general medical care, surgical care and prevention of ICH recurrence. Additionally, a treatment algorithm specific to AAICH was developed. A major purpose of the AAICH algorithm was to provide information to guide uniform, goal-directed care to this patient population resulting in better outcomes as well as lower pharmacy-related costs. The guideline was approved by the Evidence-based Practice Committee in April 2008.
The current study is intended to assess the adherence of OSUMC physicians treating AAICH to the approved treatment algorithm. Effectiveness in the areas of time to INR reversal, hematoma growth, adverse events related to anticoagulation reversal agents and patient mortality will be evaluated. Costs associated with anticoagulant reversal agents will also be assessed and compared to cost of agents used prior to the creation of the treatment algorithm.

Methods:
An IRB-approved retrospective chart review was conducted using ICD-9 codes and electronic medical records to identify patients admitted with a diagnosis of intracerebral hemorrhage while on an anticoagulation agent from May 1, 2008 through June 30, 2009. Eligible patients are those who were admitted to OSUMC and treated for anticoagulant-associated intracerebral hemorrhage. Prisoners, pregnant females, patients under 18 or ≥ 89 years of age have been excluded.

Results:
Data assessment is currently in progress.

Learning Objectives:

Describe the benefits and risks associated with various treatment strategies for warfarin reversal in intracerebral hemorrhage patients.

Discuss the impact of an AAICH treatment algorithm on patient outcomes.

Self Assessment Questions:

What are the immediate goals of treatment for AAICH?

List two benefits of using Prothrombin Complex Concentrate over fresh frozen plasma for INR correction.

PHARMACY TECHNICIANS: AN UNTAPPED RESOURCE FOR IMPROVING MEDICATION RECONCILIATION IN THE EMERGENCY DEPARTMENT

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Purpose: The objective of this study is to determine if a pharmacy technician can obtain accurate and timely patient medication lists for reconciliation in the emergency department

Methods: We conducted a pilot study that incorporated a pharmacy technician into a newly designed medication reconciliation process. This system triaged the flow of obtaining medication histories between pharmacy techs, nurses, and pharmacists. A pharmacy tech spent one week learning how to properly interview patients to obtain an accurate medication list. We tested our process over a span of 4 days. At the conclusion of the study, we analyzed timeliness, accuracy, and total percent of medication reconciliations completed.

Results: Between October 20, 2009 and October 23,2009 the nursing staff completed with 84% accuracy (baseline accuracy 68%), an average of 21 medication reconciliations per day with an average of 3.6 medications per patient and an average time of 1hr and 10min (time from when the patient came into the ED until the medication profile was updated for reconciliation). Pharmacists completed, with 94% accuracy (baseline accuracy 92%), an average of 6 med. recs. per day with an average of 11.5 medications per patient and an average time of 2 hrs. Pharmacy technicians completed with 91% accuracy, an average of 8 med. recs. per day with an average of 9.3 medications per patient and an average time of 1 hr. and 40 min.

Conclusion: This study demonstrated that allowing pharmacy technicians to obtain medication histories in the emergency department would improve the medication reconciliation process.

Learning Objectives:

Describe why it is necessary to obtain accurate medication profiles for reconciliation.

Identify "road blocks" that prohibit the development of an accurate medication list

Self Assessment Questions:

List two reasonsy why it is important to obtain accurate medication profiles in the emergecy department.

Name two "road bloks" that prevent an accurate medication profile to be obtained.

TRENDS IN ANTIBIOTIC PRESCRIBING FOR SOFT TISSUE INFECTIONS AND PNEUMONIA IN THE ERA OF COMMUNITY-ASSOCIATED METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS

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Purpose: Since 2000, there has been increasing prevalence of community-acquired methicillin-resistant Staphylococcus aureus (CA-MRSA). Commonly CA-MRSA presents as skin and soft-tissue infections (SSTI), yet concern has developed about CA-MRSA pneumonia. While there is a multitude of literature highlighting increasing trends of CA-MRSA SSTI and pneumonia, there is limited data describing trends in antibiotic usage for CA-MRSA. The primary objective of this study is to determine if there has been an increasing trend of anti-CA-MRSA coverage integrated into empiric therapies for SSTI and pneumonia in adult Kentucky Medicaid patients. Secondary objectives will evaluate subsets of the primary population to determine if there are significant trends within each group.

Methods: Used Kentucky Medicaid claims from January 1, 2001-December 31, 2008 to identify adult patients aged 18 and older who were diagnosed with SSTI or pneumonia and had a prescription dispensed for an antibiotic(s) within 72 hours of the diagnosis. The secondary objectives had patient information extracted including co-morbid diseases-(ICD-9 codes), procedures-(CPT codes), gender, rurality-(USDA rural continuum) and age. Quantity of anti-MRSA antibiotics were aggregated for each year. The trend of antibiotic usage over time was charted. Chi-squared statistics and linear regression were used for data analysis.

Results (In progress): In the SSTI group, the study found a difference in the trends of beta-lactams and agents with coverage for CA-MRSA usage in the study period. Linear regression using interaction terms in the model found a statistical difference between the two trend lines ($p<0.001$). Similar results were obtained for the secondary objective analysis.

Conclusions: Final results for both disease states and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

To describe the increasing trends of community-acquired methicillin-resistant Staphylococcous aureus (CA-MRSA)

To recognize outpatient agents to trend CA-MRSA infections

Self Assessment Questions:

Which patient would be considered to have a CA-MRSA infection?
A)50 year old diabetic patient who gets dialysis at a clinic 3 times a week
B)18 year old college football player
C)80 year old woman who resides in a local nursing home
D)36 year old male who was admitted for myocardial infarction 8 months ago

According to algorithm co-developed by the Infectious Disease Society of American, Centers of Disease Control and American Medical Association for outpatient management of skin and soft-tissue infections (SSTI), which agent would you most likely use first to treat an SSTI?
A)Levofloxacin
B)Amoxicillin/Clavulanate
C)Clindamycin
D)SMZ/TMP

PHARMACIST-LED ADMISSION MEDICATION RECONCILIATION FOR GERIATRIC PATIENTS ADMITTED TO A GENERAL MEDICINE/SURGERY FLOOR

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Medication errors are associated with increased morbidity, mortality, and length of hospital stay, and are most likely to occur at care interfaces. Pharmacist-led medication reconciliation at admission reduces medication errors while maintaining cost-effectiveness. Limited resources can make it crucial to identify patients most benefiting from pharmacist-led medication reconciliation. Geriatric patients are at risk for admission medication errors and represent a group to target for such practice. Our purpose was to evaluate the effectiveness and feasibility of comprehensive medication reconciliation performed by a pharmacist in reducing admission medication errors for geriatric patients admitted to a general medicine or surgery floor.

Patients greater than 70 years of age admitted to a medicine or surgery floor were randomized to receive medication reconciliation per normal practice (i.e. pharmacist, physician, and/or nurse review of medication list; Group 1) or normal practice plus intensive pharmacist-led medication reconciliation (i.e. formal medication history utilizing a variety of outside resources; Group 2) within 24 hours. Interventions were evaluated by a geriatrics fellow at 48 hours. The primary outcome measured was difference in medication profile appropriateness at 48 hours between groups. Forty patients per group were calculated to be necessary to obtain 80% power to detect a difference in the primary endpoint. Other data collected includes time to medication reconciliation, time spent per patient, source of information, and intervention significance.

At this time, 53 patients have been enrolled in the study. Mean patient age was 79 years and 66% of patients were female. Pharmacists identified 90 errors (1.7 errors per patient) requiring intervention. Sixty-six percent of patients had a least one error requiring intervention, with a mean of 2.6 errors per patient. Mean time per patient was 25 minutes. Preliminary results suggest significant benefit of pharmacist-led medication reconciliation for geriatric patients.

Learning Objectives:

Explain the rationale for pharmacist-led medication reconciliation.

Identify challenges for pharmacist-led medication reconciliation.

Self Assessment Questions:

Where are medication errors most likely to occur?

What are some potential outcomes of medication errors?

HEPARIN INDUCED THROMBOCYTOPENIA IN SUBARACHNOID HEMORRHAGE PATIENTS: INCIDENCE, TREATMENT, AND OUTCOME

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PURPOSE: At the University of Illinois Medical Center at Chicago (UIMCC), subarachnoid hemorrhage (SAH) patients receive venous thromboembolism (VTE) prophylaxis with unfractionated heparin (UFH) and sequential compression devices (SCDs) following surgical or neurointerventional treatment. It is hypothesized that neurosurgical patients have an increased risk of Heparin Induced Thrombocytopenia (HIT) Type II (clinically dangerous form of HIT) due to their postoperative status and frequent exposure to heparin products including the frequent use of indwelling catheters flushed or impregnated with UFH. At UIMCC, if a patient is suspected of developing HIT without thrombosis, the practice has been to following attending physician discretion (e.g. switching the UFH to fondaparinux prophylaxis with the optional placement of an inferior vena cava filter (IVCF) to prevent PE). If HIT with thrombosis (HITTS) is discovered, the practice has been to stop the UFH and place an IVCF. Treatment with full anticoagulation as recommended by consensus guidelines potentially was delayeddue to perceived high risk of bleeding complications. The goals of this retrospective study are to determine the incidence of HIT-antibody positive patients with SAH at UIMCC, to examine the treatment strategies for HIT/HITTS employed in our center, and to evaluate the outcomes of this practice.

METHODS: This study will be a retrospective chart review of adult SAH patients admitted between January 1, 2006 and December 31, 2009 who developed HIT . Subjects will be identified by query of UIMCC laboratory records to identify patients with a positive HIT-antibody assay. All patients will be > 18 years of age and discharged from the UIMCC to qualify. The primary outcome is defined as the incidence of new or worsening thrombosis prior to discharge. Secondary outcomes will include the incidence of major bleeding complications and the incidence of new or worsening thrombosis at 3 months.

RESULTS: Pending

CONCLUSIONS: Pending

Learning Objectives:

Recognize the theoretical clinical dilemma in treating SAH patients diagnosed with HIT/HITTS.

Describe the outcomes associated with HIT/HITTS management at UIMCC in SAH patients.

Self Assessment Questions:

True or False. SAH patients are at a potential increased risk of HIT/HITTS.

At UIMCC, typical treatment of a SAH patient diagnosed or suspected with HIT/HITTS may include all of the following except:
a.Discontinuing UFH
b.Starting LMWH
c.Begin prophylaxis with fondaparinux
d.Place IVCF.

NITROFURANTOIN AND ITS APPROPRIATENESS IN PATIENTS WITH RENAL DYSFUNCTION

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Purpose:
Nitrofurantoin, a urinary anti-infective, is used for both the prophylaxis and treatment of urinary tract infections. Its spectrum of activity includes Staphylococcus aureus, Enterococcus faecalis, Escherichia coli, Citrobacter, and Klebsiella. Nitrofurantoin provides a viable option for patients who have resistant cultures to more traditional therapies such as ciprofloxacin, sulfamethoxazole-trimethoprim, and cephalexin. Although it provides an effective alternative, the medication does have its limitations. In order to obtain adequate concentrations in the urine a patients creatinine clearance must be at least 60ml/min per the manufacturer. Furthermore, nitrofurantoin is contraindicated in patients with a creatinine clearance of less than 60ml/min. The purpose of my study is to evaluate the appropriateness of nitrofurantoin use in various patients with regard to empiric indication, renal function, as well as culture and sensitivity results. Secondarily, the educational impact on nitrofurantoin dosing and renal requirements will also be evaluated as a component of the study.

Methodology:
To better understand its use and effects at our institution a medication use evaluation (MUE) was performed. A retrospective chart review was done on all patients that received an order for nitrofurantoin from September 30th 2008 to September 29th 2009. A total of 380 charts were examined. To determine the appropriateness of prescribing, data collected included patient age, height, weight, kidney function, culture sensitivity results, and schedule prescribed. Results of the medication use evaluation will be presented at antimicrobial stewardship meeting where policies regarding judicious antibiotic use are discussed and drafted. Recommendations will be made based on MUE results to limit inappropriate prescribing and use. Furthermore, results will also be presented at the pharmacy and therapeutics committee to finalize and approve any recommendations made. After policies and protocols are approved, education will be provided to the medical and pharmacy staff on the proper use of nitrofurantoin.

Learning Objectives:

Determine the appropriateness of nitrofurantoin use and its impact on patients

List alternative therapies available for those who do not qualify for nitrofurantoin treatment

Self Assessment Questions:

T or F: Prophylactic dosing does not necessitate the same renal requirements because of its once daily dosing schedule

T or F: A creatinine clearance of 50ml/min is a contraindication to treatment.

CHARACTERIZATION AND OUTCOMES OF TREATMENT WITH TRANSARTERIAL CHEMOEMBOLIZATION (TACE) FOR HEPATOCELLULAR CARCINOMAS IN ADULT PATIENTS AT METROHEALTH MEDICAL CENTER(MHMC)

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Background: Hepatocellular carcinoma (HCC) is a serious disease with an increasing incidence worldwide. The majority of patients with HCC are not eligible for curative therapies. One of the options available to those who are not eligible is TACE, which results in increased survival over conservative treatment. However, TACE is not standardized and institutions have various methods for selecting patients and use differing chemotherapeutic agents. My aim is to characterize both the patients as well as their outcomes to treatment with TACE for HCC at MHMC and compare these outcomes with those of other institutions.

Methodology: A retrospective data review will be conducted on patients who received at least one TACE treatment from 2000-2009. All adult patients will be identified through pharmacy records. Data will be collected from MHMC's electronic medical records. Extensive demographic information will be collected. All treatments used for HCC will be collected, as well as, date(s) of treatment, components of the chemotherapy, number of treatments, and cumulative chemotherapy doses. Laboratory values and cardiac studies will be collected in addition to, tumor stage by AJCC criteria, imaging studies, pathology reports, performance status and patient outcomes. Study data will be analyzed through the use of descriptive statistics. When appropriate, a students t-test will be used to compare the outcomes to those of other institutions via local and national databases. The information provided by this study will help to determine if MHMCs standard TACE procedure has comparable outcomes to other institutions and published literature. Results may lead to a change in practice at our institution.

Results/conclusions: Data collection is ongoing. Results will be presented at the conference.

Learning Objectives:

Identify patients at risk of developing hepatocellular carcinoma and clinical features of the disease.

Explain how chemoembolization is used as a treatment for hepatocellular carcinoma.

Self Assessment Questions:

Hepatocellular carcinoma is the most common form of primary liver cancer and females are at increased risk of developing HCC. True/False

The majority of patients with HCC are eligible to receive curative therapy. True/False

CHARACTERIZATION OF GLUCOSE BEHAVIOR DURING INDUCED HYPOTHERMIA AND REWARMING

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Purpose: Induced hypothermia is utilized to preserve neurologic function in patients resuscitated from cardiac arrest. Glucose control in this population has not been studied extensively. Hyperglycemia and variability in glucose have been shown to have adverse outcomes in critically ill patients including an increase in morbidity and mortality. The purpose of this study is to characterize glucose behavior and the effect of exogenous insulin administration during induced hypothermia and rewarming.

Methods: Retrospective, observational analysis of post-cardiac arrest patients completing the induced hypothermia and rewarming protocol between September 2008 and August 2009. Patients were excluded if they were less than 18 years of age or did not have blood glucose values obtained during the induced hypothermia protocol. Baseline characteristics including gender, age, history of diabetes, hemoglobin A1C, weight, and height were collected for each patient if available. Documented sepsis and the use of vasopressors or corticosteroids were also recorded. The glucose values obtained during induced hypothermia and rewarming were collected and analyzed as well as the amount of insulin and glucose administered and correlating body temperatures. These values were utilized to evaluate glucose behavior and the effect of exogenous insulin during the hypothermia and rewarming process.

Preliminary Demographics (n=32):

Of the patient population evaluated, demographic information is as follows: Male (69%), average age 54 years, average BMI of 31.1. Average hemoglobin A1c was 6.78 g/dL, 24% had diabetes. During the hypothermia protocol 88% of patients received exogenous insulin; of those patients 43% received subcutaneous and 57% intravenous insulin. Sepsis was documented in 16% of patients, 16% were given steroids and 50% received at least one vasopressor.

Results and Conclusions: To be presented

Learning Objectives:

Describe glucose behavior during induced hypothermia and rewarming.

Discuss the incidence of hyperglycemia and hypoglycemia relative to body temperature and amount of insulin received during induced hypothermia and rewarming.

Self Assessment Questions:

Endogenous insulin production increases during induced hypothermia. T/F

Tight glycemic control reduces morbidity and mortality in critically ill patients by:
a.reducing risk of infection
b.reducing development of renal failure
c.reducing incidence of polyneuropathies
d.all of the above

RETROSPECTIVE ANALYSIS OF ALVIMOPAN IN OPEN ABDOMINAL COLORECTAL SURGICAL PROCEDURES

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Purpose: Following abdominal surgery involving the large or small bowel, postoperative ileus (POI) is one of the most common complications in patient recovery. Alvimopan is a peripherally acting μ-opioid receptor antagonist (PAM-OR) indicated to accelerate the time to upper and lower GI recovery following partial large or small bowel resection surgery with primary anastomosis. The objective of this study is to compare the post-operative length of stay (LOS) and recovery of GI function in patients who received alvimopan plus standard of care versus standard of care alone following open abdominal colorectal surgical procedures.

Methods: This study has been approved by the Institutional Review Board at SJH. This is a non-interventional retrospective cohort study. Patients with documented open abdominal colorectal surgery since August 2008 who received at least one dose of alvimopan preoperatively and one dose postoperatively will be screened for study inclusion and matched with a historical control patient according to surgical procedure type. Study subjects with incomplete medical records, under 18 years of age, severe hepatic impairment, end stage renal disease, pregnant or lactating, or with a history of post operative ileus will be excluded. The following data will be collected from hospital electronic medical record databases for each patient: patient demographics and baseline characteristics; alvimopan treatment information; other treatments administered for POI; type of open abdominal surgery; LOS, time to GI recovery; and laboratory/monitoring data. The primary endpoint of this study is to compare the postoperative LOS of patients who received standard postoperative care plus alvimopan versus standard post-operative care alone. The secondary endpoint will be to compare the mean time to recovery of GI function between treatment groups.

Results: Data collection and statistical analysis will be completed by April 2009. Final results with conclusion will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Evaluate the postoperative length of stay and recovery of GI function in patient treated with alvimopan plus standard of care versus standard of care alone in a small community hospital setting.

Discuss the potential role for alvimopan in a small community hospital.

Self Assessment Questions:

What have previous trials shown to be the decrease length of stay in patients who take alvimopan with POI following abdominal surgery?

What role do opioids play in postoperative ileus following abdominal surgery?

IMPACT OF TIME TO FOLLOW-UP AFTER HOSPITAL DISCHARGE ON INTERNATIONAL NORMALIZED RATIO

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PURPOSE:
The period between hospital discharge and outpatient follow-up for patients on warfarin therapy is critical. Good communication between inpatient and outpatient providers is required, as well as appropriate patient education regarding the importance of monitoring and the factors influencing INR. The purpose of this study is to determine whether ensuring a maximum of 7 days to follow-up after discharge for patients on warfarin therapy decreases incidence of sub- or supra-therapeutic INR levels. Secondary endpoints will assess the occurrence of complications attributed to nontherapeutic INR levels. Appropriate documentation, use of the inpatient warfarin protocol and use of enoxaparin bridge therapy will also be assessed.
METHODS:
A retrospective chart-review is being conducted on patients discharged from the VA on warfarin therapy between October 1st, 2008 and September 30th, 2009. On October 1st, 2009 a bi-weekly review of newly initiated warfarin inpatients was initiated. The Anticoagulation Therapy Program Coordinator contacts those patients without a scheduled follow-up and INR order within 7 days of discharge to schedule an appointment and lab draw. A second cohort discharged between October 1st, 2009 and December 31st 2009 will undergo chart-review to determine the effectiveness of the intervention. Prior to initiation of this study, approval through both IUPUI and the VA Internal Review Boards was obtained. Descriptive statistics will be used to assess data points detailed on the data collection sheets and t-tests will be conducted to compare cohorts. Correlations between time to follow-up and INR level will be determined and regression analysis used to establish the extent of relationship between time to follow-up and INR. Results will be evaluated for evidence that a bi-weekly review of patients discharged on warfarin therapy will prevent complications associated with nontherapeutic INR levels. Correlations between other individual data points and follow-up INR will also be reviewed.
CONCLUSIONS: Pending at time of submission.

Learning Objectives:

Describe the key components to safe and effective discharge planning for patients on warfarin therapy.

Identify an appropriate time to follow-up for patients discharged on warfarin therapy.

Self Assessment Questions:

List the key components to safe and effective discharge planning for patients on warfarin therapy.

What is the appropriate time to follow-up after hospital discharge for patients initiated on warfarin therapy ?

STO2 AND VASOPRESSORS IN SEPTIC SHOCK (STOVISS)

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Purpose:
The treatment of sepsis continues to be a medical challenge. Current recommendations include evaluation of markers of tissue hypoperfusion. These measurements often require invasive procedures. A new technology allows for non-invasive measurement of tissue oxygen saturation (StO2) through a probe placed on the patients hand. Vasopressors are known to increase perfusion, but it is unknown how they affect tissue oxygenation at the vascular level. This study seeks to observe the relationship between StO2, mean arterial pressure (MAP), end organ function, and 28 day mortality in septic patients requiring vasopressors.

Methods:
Adult patients in the intensive care unit (ICU) with sepsis and requiring pressors will have a StO2 monitor applied to the hand within 24 hours of requiring pressors and it will remain for 48 hours, 12 hours after the discontinuation of vasopressor therapy, patient transfer out of the ICU, patient death, or at the time of an order to make the patent hospice or comfort care, whichever endpoint comes first.

Patients will then be divided into four groups: 1) MAP within desired range (≥65 as defined by Surviving Sepsis Campaign), StO2 within desired range (≥78% as defined by Leone et al) 2) MAP within desired range, StO2 below desired 3) MAP below desired range, StO2 within desired range 4) MAP and StO2 below desired ranges.

Endpoints:
The primary endpoint will be 28 day mortality. The secondary outcome will be comparison of end organ perfusion. End organ perfusion will be measured by urine output, serum creatinine, AST/ALT, and lactate.

Statistics:
Results will be analyzed using Chi-square for nominal data and ANOVA for interval data.

Results and Conclusions:
To be discussed upon completion of data collection.

Learning Objectives:

Discuss utility of StO2 monitoring in patients with septic shock

Identify alternative measures of adequate resuscitation in patients requiring pressors

Self Assessment Questions:

1. What is the recommended mean arterial pressure resuscitation endpoint defined by Surviving Sepsis Campaign?
a. ≥ 80
b. ≥ 65
c. 70
d. 75

2. Early goal directed therapy is beneficial in the management of septic patients?
a. True
b. False

OBSERVING PROCEDURES RETROSPECTIVELY AND TARGETING INNOVATIONS IN OPERATIONS NECESSARY FOR ENHANCING SURGICAL CARE IMPROVEMENT PROJECT (SCIP) COMPLIANCE IN A COMMUNITY TEACHING HOSPITAL: OPERATION SCIP

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Background/Purpose
The Institute for Healthcare Improvement estimates that 780,000 surgical site infections occur annually in the United States. In order to improve outcomes and safety in surgical patients, the Joint Commission and Centers for Medicare and Medicaid Services collaborated and developed what is now known as the Surgical Care Improvement Project (SCIP) in 2006. Although SCIP measures outline the steps necessary to improve surgical care in most patients, specificity regarding antibiotic optimization in certain populations (e.g. obese), is lacking. In an effort to improve surgical outcomes, Advocate Illinois Masonic Medical Center (AIMMC) had taken steps to advance its SCIP program, with a focus on education. Although collaboration among AIMMC staff has led to an increased average SCIP compliance rate of 90% in 2009, additional efforts are warranted for further improvement. Therefore, the purpose of this study is to demonstrate that further process improvements (PIs) will increase AIMMCs SCIP compliance rate, to a goal of >95%. Innovations targeted to improve operations include the addition of surgery-specific order sets to the computerized physician order entry (CPOE) system, including weight-based dosing parameters, and the provision of on-going education (e.g. nursing in-services, visual aids) for all surgical staff.

Methods
The study will be conducted retrospectively, by identifying and reviewing patients surgical records from 2009 - 2010. Patients who underwent a surgical procedure requiring antimicrobial prophylaxis will be included. Two distinct time periods will be examined: pre- (January 2009 - December 2009) and post- (January 2010 - present) implementation of new AIMMC SCIP policies.

Results and Conclusions
Data collection and evaluation are ongoing. Results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Identify common factors that increase the risk of surgical site infections and detail interventions that can be utilized to avoid the pitfalls in ensuring continued process improvements.

Recognize the utility of collaborative, interdisciplinary efforts in pre-, intra-, and post- operative processes in order to improve a hospitals SCIP compliance rate.

Self Assessment Questions:

According to SCIP recommendations, after the surgical procedure is performed, assuming no infection is present, antibiotics should be discontinued within:
a.Immediately after surgery; no antibiotics should be given once the procedure is complete
b.24-48 hours, depending on the surgery
c.48-72 hours, regardless of the surgery
d.3 days, regardless of the surgery

True or False: SCIP measures explicitly outline dosing recommendations for patients with varying age, weight, and organ dysfunction

EVALUATION OF THE MEDICATION ORDER TRANSCRIPTION PROCESS AT A COMMUNITY HOSPITAL

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PURPOSE: According to the Institute of Medicine (IOM), when all errors are considered, a hospitalized patient can expect to be subjected to at least one medication error per day of hospital admission. Brought forth in the same (IOM) report is the estimate that between 380,000 and 450,000 preventable adverse drug events (ADEs) occur each year in hospitals across the United State. Many of these preventable ADEs are the result of errors. Furthermore, it has been shown that 11% of medication related errors occur during the medication order transcription process.

St. Elizabeth Healthcare is in the process of implementing a new information technology system that will allow for the use of an electronic medication administration record (eMAR). This new system will redefine the transcription process within the healthcare system. The primary objective of this research project is to quantify the number of medication order transcription errors that occur as a result of the current transcription process. As a secondary objective transcription errors identified in this study will be compared to the number of transcription errors identified in the hospitals voluntary error reporting system.

METHODS: This research study was submitted to the St. Elizabeth Healthcare institutional review board and has been granted an exempt status. The primary data collection method consists of a retrospective chart review. Charts were reviewed for patients admitted to the transitional care unit (TCU) of a 184 bed hospital within the healthcare system during the first seven days of October and November 2009.

RESULTS: To date 105 patient charts met the inclusion criteria and were reviewed. One-hundred five transcription errors have been identified thus far. Further analysis of results will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

List the four steps most commonly followed in the delivery of medications to hospitalized patients.

Discuss why errors may occur as a result of the traditional medication order transcription process.

Self Assessment Questions:

T/F the majority of medication errors and subsequent ADEs that occur in the hospital setting are thought to arise as a result of the transcription process?

In the United States, when all medication errors are considered a hospitalized patient can expect to experience medication errors per day of hospital admission.
a.0.5
b.0.75
c.1
d.1.5

ENHANCED COMMUNICATION IN PRIMARY CARE - USE OF A NOVEL INTRANET COMMUNICATION TOOL TO FOSTER COLLABORATIVE CARE

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PURPOSE: The goals of this pilot study are to implement and assess how a novel web-based tool can facilitate communication between an independent family practice physician and a community pharmacy.
METHODS: A web-based tool currently used by physicians for documentation, billing, and electronic prescribing will be conjoined with a separate, web-based tool used to document and bill for pharmacist-provided cognitive services. The two separate tools will have the ability to facilitate internal messaging between physicians and pharmacists using these tools. The process of providers sending and receiving these messages will be observed to determine their ability to enhance physician-pharmacist communication. Data will be collected for two months prior to the intervention using traditional telephone and fax communication methods and compared with data collected for two months following implementation of the web-based tool. Collected data observes multiple dynamics of the intervention process. The physician(s), pharmacists and each of their staff will be informally interviewed to provide feedback on overall usability and satisfaction with the tool. Facilitators and barriers for greater use and sustainability will be explored. A qualitative assessment of effective training strategies and processes to scale up this tool to other physicians and pharmacies will be conducted.
PRELIMINARY RESULTS: The change in interventions and timeliness of interventions will be important markers along with feedback from those who use and interface with this web-based tool. Providing a standardized process to implement these tools, and characteristics of stakeholders ready to adopt such a tool will help target expansion of the web-based interface.
CONCLUSION: This tool may provide an opportunity to use technology to improve communication between physicians and pharmacists and facilitate greater quality of care and staff efficiency while reducing the time commitment of the physician and pharmacist.

Learning Objectives:

Explain how a novel communication method affects a physicians responsiveness to pharmacist-based recommendations.

Identify facilitators and barriers to implementing a web-based communication tool intended to improve quality and safety in health care.

Self Assessment Questions:

1.The Institute for Safe Medication Practices (ISMP) identified six principles required to maximize the benefit of MTM services. Which of the following principles does this study aim to address?
a.Monetary reimbursement for cognitive pharmacy services, with national recognition of pharmacist treatment billing codes
b.Increased number of pharmacy school graduates and their training on cognitive services.
c.Physicians and other healthcare providers referring and maintaining patients within the MTM services.
d.Expanded use of technology in order to lowers costs and improve efficiency.

2.Barriers to e-prescribing are being revealed as its adoption becomes more widespread. Which of the following could be considered a barrier to e-prescribing?
a.E-prescribing is a one-way communication process.
b.A successful e-prescribing system needs to be developed by an interdisciplinary team.
c.The FDA should host a single e-prescribing system for the country.
d.E-prescribing has raised concerns about HIPAA compliance.

EVALUATION OF BETHANECHOL FOR THE TREATMENT OF GASTROPARESIS

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Purpose
Gastroparesis commonly occurs in diabetic and post-surgical patients, but can also be idiopathic. Treatment usually consists of prokinetic agents, such as metoclopramide and erythromycin and anti-emetics, such as ondansetron. More recently, in patients who are refractory to these agents, botulinum toxin, gastric electric stimulation, and bethanechol have been used in an attempt to control gastroparesis. This project will serve as a tool to evaluate the efficacy of bethanechol to control symptoms of gastroparesis in patients at University Hospital. It will also evaluate previously attempted treatments for gastroparesis and changes to those medications after bethanechol is initiated.

Objectives
To determine the efficacy of bethanechol for the treatment of gastroparesis (specifically regarding improved ability to tolerate oral intake, decrease in nausea/vomiting). To determine the dose and duration at which patients symptoms improve, reasons for medication discontinuation, and rate of readmission due to gastroparesis symptoms after initiation of bethanechol.

Methods
This project will be a retrospective review of all University Hospital patients being treated for gastroparesis with bethanechol. Exclusion criteria include less than 18 years of age, pregnant females, and prisoners. The following data will be collected: patient age, weight, gender, relevant past medical history (disease state, time from past medical history diagnosis to bethanechol initiation), previous/current treatment received for gastroparesis (drug, dose, duration of use, adverse drug reaction), bethanechol use (arrival medication or initiated while inpatient, if use interrupted, reason for doing so), dose of bethanechol and duration of that dose, response to treatment (decreased nausea and vomiting, improved ability to tolerate food), adverse drug reaction with bethanechol, number of readmissions to the hospital while on bethanechol, and comment on patient outcomes.

Results
This project is in the data collection phase. Results and conclusion will be presented at the conference.

Learning Objectives:

To become familiar with the bethanechol use

To recognize the benefits and risks associated with bethanechol use

Self Assessment Questions:

What are the most common side affects associated with bethanechol use?
a. Diarrhea, urgent need to urinate, excessive sweating
b. Headache, nausea, vomiting
c. Hypertension, myalgia

What is the starting dose of bethanechol for gastroparesis?
a.5 mg TID
b.25 mg TID
c.50 mg TID

AN EVALUATION OF COMFORT CARE KIT USE IN HOSPICE PATIENTS

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Purpose: Comfort care kits (CCK) contain medication for symptom palliation and are a common practice in hospice that has been shown to provide positive impact on quality of life. Kits are placed in hospice patients homes to have medications immediately available for management of acute symptoms and to prevent, if possible, the need to transfer the patient to a higher level of care. CCKs most commonly contain medication to treat pain, dyspnea, anxiety/agitation, nausea/vomiting, fever, and terminal secretions. The financial impact of the kits on hospice cost has not been evaluated. The studys goal is to examine the cost and extent of unused comfort care kits as it relates to terminal diagnosis. Determining the cost of unused kit components based on terminal diagnosis can help target kit placement for improved utilization, thereby providing an indicator of kit cost-effectiveness.
Methods: This study will be conducted as a retrospective chart review. Patients will be identified through the reporting feature of HospiScript website. HospiScript is a hospice specific pharmacy benefits manager contracted with the hospice to process claims for hospice covered medications. A report will be generated identifying deceased patients who have received a CCK at the hospice from 08-01-2007 to 07-31-2009 using the HospiScript database. The following data will be collected from the patient medical record chart: patient age, gender, terminal diagnosis, hospice length of stay, functional status on admission indicated by Palliative Performance Scale, CCK delivery method and unused CCK contents. The primary outcome is to examine the cost and extent of unused CCK as it relates to terminal diagnosis. Secondary outcomes will examine individual unused CCK components as they relates to other patient demographics. All data will be recorded without patient identifiers and maintained confidentially.
Results/Conclusion: The results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Outline the role of comfort care kits in hospice care.

Recognize the financial impact of comfort care kits on hospice medication expense.

Self Assessment Questions:

Symptoms not commonly addressed in comfort care kits include the following:

True or False:

IMPACT OF A COMPUTERIZED INSULIN INFUSION PROGRAM ON GLYCEMIC CONTROL IN THE INTENSIVE CARE UNIT

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Purpose:
The purpose of this study is to compare a computerized insulin infusion program with a manual, paper-based insulin administration protocol in achieving target glucose levels in the ICU.

Methods:
This is a retrospective chart review of patients admitted to the ICU between January 2008-December 2009 at Wishard Hospital, Indianapolis, IN. Patients who were receiving insulin using a paper-based protocol were compared to patients who were on a computerized insulin infusion program, which replaced the paper protocol n the ICU as of January 21, 2009. We compared a three-month time range of patients utilizing the computer program (April 1- June 30, 2009) with a cohort of patients on the paper protocol in the same three months of the previous year (April 1- June 30, 2008). Patients were included if they were admitted to the ICU within the date range. Patients were excluded if they were in the Burn unit at any time, if they were prisoners, or if they were diagnosed with diabetic ketoacidosis. The primary outcome is percent (%) of total glucose values within the target range (90-130 mg/dL). Secondary outcomes include time to first target glucose, overall mean glucose, nosocomial infection rate, ICU and hospital length of stay, mechanical ventilation days, and mortality.

Preliminary Results:
A total of 61 patients and 5,496 glucose readings were included in the paper protocol group, compared to 50 patients and 5,645 glucose readings in the computer group. There was a higher percentage of glucose values within target range in the computer group compared to the paper group (68% vs. 37%). Data collection and analysis is ongoing. Conclusions will follow upon completion.

Learning Objectives:

Describe the theory of stress hyperglycemia and its association with negative outcomes in the ICU, citing evidence for harmful effects.

Recall the results of studies comparing computerized insulin infusion programs with manual protocols.

Self Assessment Questions:

Which of the following statements regarding "stress hyperglycemia" is TRUE?
a. Hyperglycemia in critical illness has always been perceived as a harmful clinical state.
b. Literature suggests that hyperglycemia in the ICU is associated with shorter lengths of stay in the hospital.
c. Hyperglycemia in critical illness is characterized by cellular glucose overload in insulin-dependent cells leading to apoptosis.
d. Increased levels of cortisol in critical illness acts to suppress further gluconeogenesis via a negative feedback loop.

True/False. In general, studies comparing computerized insulin infusion programs with manual protocols indicate that computer programs may result in better blood glucose control to target levels in the ICU.

EVALUATION OF APPROPRIATENESS/INAPPROPRIATENESS OF MEDICATION PRESCRIBING USING THE STOPP/START CRITERIA IN HOME BASED PRIMARY CARE VETERANS

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PURPOSE: Inappropriate medication use can predispose elderly patients to adverse events. Several validated methods to assess inappropriate prescribing in elderly patients have been developed. The START/STOPP (Screening Tool of Older Persons Prescriptions/Screening Tool to Alert doctors to Right Treatment) criteria were developed due to limitations found in existing criteria and were found to be comprehensive, valid and reliable. The purpose of this study is to evaluate the appropriateness/inappropriateness of medication prescribing using the STOPP/START criteria in elderly Home Based Primary Care (HBPC) veterans and measure the potential impact of the HBPC team on appropriate/inappropriate prescribing.

METHODS: This is a retrospective chart review of 200 patients newly enrolled in the HBPC program at Edward Hines, Jr. VA Hospital from September 1, 2007 to September 30, 2009. Appropriate/inappropriate medication prescribing will be evaluated by reviewing initial team notes; including a pharmacist note, for recommendations consistent with the STOPP/START criteria. The total number of criteria met at initial HBPC enrollment will be compared to the number of criteria met after 15 weeks. Patients will be included if they are 65 years or older and have an initial evaluation and interdisciplinary care plan conducted by the HBPC team. Exclusion criteria include hospital admission any time between the initial medication review and follow-up review within 15 weeks, admission to the HBPC program for palliative or hospice care, or death prior to completion of a second medication evaluation. The secondary outcome to be evaluated will be the impact of pharmacist recommendations on appropriate medication prescribing. Data collected will be pharmacist recommendations regarding: number of recommendations accepted, dosage adjustments, medication renewals, adverse drug reactions, drug-drug interactions, drug-disease interactions, allergies, monitoring of laboratory values and medications initiated or discontinued.

RESULTS AND CONCLUSIONS: Data collection is currently in progress.

Learning Objectives:

Discuss potential adverse drug events that may be caused by inappropriate medication prescribing in elderly patients.

Identify medications with a potential benefit in the elderly population.

Self Assessment Questions:

True or False: The STOPP criteria identifies aspirin >150 mg/day as potentially inappropriate.

Which medication class affecting the central nervous system is identified most frequently as contributing to adverse events?

EVALUATION OF A NEW MODEL OF CARE FOR TOBACCO CESSATION IN A VETERAN POPULATION

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PURPOSE:
Timely and effective tobacco use interventions can decrease the risk of developing smoking-related diseases. In August 2009, the tobacco cessation clinic at the William S. Middleton Memorial Veterans Hospital changed their clinic model in an attempt to improve patient accessibility and enhance overall patient care. The clinic now offers an individual telephone counseling option in addition to the previously available group clinic. The purpose of this study is to examine the efficacy of this new tobacco cessation clinic model compared to the historical tobacco cessation clinic model and standard medical care.

METHODS:
This study is a retrospective chart review of patients who were newly prescribed nicotine replacement therapy, bupropion or varenicline from September 1, 2008 to November 30, 2008 and patients who were newly enrolled in the tobacco cessation clinic from September 1, 2009 to November 30, 2009. Patients who were prescribed bupropion solely for mental health conditions or who received counseling without tobacco cessation medication therapy will be excluded. Data collected will include demographic information, model of care (standard medical care, historical or current tobacco cessation clinic), tobacco cessation medications prescribed (medication, dose, duration), success of the quit attempt, method of referral to the tobacco cessation clinic, and whether patients completed the full tobacco cessation clinic program. Descriptive statistics will be used to analyze the collected data. The primary endpoint will be tobacco cessation rates. Secondary endpoints will include the referral method used most often for the tobacco cessation clinic, accessibility (number of patients enrolled), tobacco cessation clinic drop-out rate, cost per successful quit attempt and the percentage of patients who received evidence-based tobacco cessation therapy.

RESULTS/CONCLUSION:
The results and conclusion are pending.

Learning Objectives:

Recognize the negative impact that tobacco use has on society.

Outline key concepts regarding counseling and medication therapy recommendations for effective tobacco cessation.

Self Assessment Questions:

True or False: Smoking is the third leading cause of preventable death in the United States and accounts for an estimated $96 billion per year in direct medical expenditures.

Which of the following medication combinations is effective for smoking cessation and is recommended as first-line therapy in the Clinical Practice Guidelines?
a. Varenicline and nicotine gum
b. Bupropion SR and nicotine patch
c. Clonidine and nicotine inhaler
d. All of the above

THE SAFETY AND TOLERABILITY OF CONTINUOUS INFUSION AMPHOTERICIN B DEOXYCHOLATE IN PATIENTS WITH FUNGAL INFECTIONS

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Background: Amphotericin B deoxycholate has broad spectrum antifungal activity, but has been associated with toxicities that can limit its clinical utility. These side effects may include nephrotoxicity, electrolyte abnormalities, and infusion-related side effects, such as fever, chills, rigors, nausea, and vomiting. In an effort to reduce nephrotoxicity and infusion-related side effects of amphotericin B, liposomal, lipid complex, and colloidal dispersion formulations of amphotericin B have been introduced to market. However, these formulations are expensive and do not have a proven efficacy benefit over amphotericin B deoxycholate. Recent studies have described that continuous infusion of amphotericin B deoxycholate decreases nephrotoxicity and infusion-related side effects compared with conventional infusion of the drug over two to six hours. The objective of this study is to describe the safety and tolerability of continuous infusion amphotericin B deoxycholate in patients with fungal infections.

Methods: This study is a retrospective chart review of patients with documented or suspected fungal infections who received continuous infusion of amphotericin B deoxycholate at Methodist Hospital of Indiana and St. Francis Hospital and Health Centers from January 2004 to March 2010. The primary outcomes are safety measures, including infusion-related reactions, nephrotoxicity, laboratory abnormalities, and reason for discontinuation of continuous infusion therapy. Secondary outcomes are clinical status of fungal infection, total length of stay (LOS) in the hospital, LOS in the intensive care unit, and patient disposition. Exclusion criteria include pregnant patients, patients less than 18 years of age, and patients who received less than 72 hours of therapy.

Results/Conclusion: Data collection is in progress. Results and conclusions of the safety and tolerability of continuous infusion amphotericin B deoxycholate will be presented at the Great Lakes Residency Conference.

Learning Objectives:

Recognize the potential side effects of the various formulations of amphotericin B.

Describe the safety and tolerability of continuous infusion of amphotericin B deoxycholate.

Self Assessment Questions:

True or False: Side effects related to intermittent infusions of amphotericin B deoxycholate include fevers, chills, rigors, nausea, and vomiting.

True or False: Continuous infusions of amphotericin B deoxycholate may decrease the incidence of nephrotoxicity associated with its therapy.

EFFECTS OF A PHARMACIST-INITIATED SELF-MONITORING OF BLOOD GLUCOSE (SMBG) INTERVENTION ON PATIENTS BEHAVIORS, KNOWLEDGE, AND SATISFACTION ASSOCIATED WITH TESTING

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Purpose:
The primary objective of this study is to determine if a pharmacist-initiated self-monitoring of blood glucose (SMBG) intervention impacts patients blood glucose testing behaviors. Secondary objectives include impact of the intervention on patients knowledge of SMBG, overall satisfaction with their blood glucose testing process, and sales of blood glucose monitors and testing supplies.

Methods:
An original written survey will be developed, pilot-tested, and administered to patients with diabetes at five community pharmacy locations in Ohio. English-speaking patients who are ≥ 18 years old and not pregnant taking at least one medication for diabetes will be included in the study. Eligible patients will be asked to participate while picking-up their refill(s) for their diabetic medication(s). Following patient consent and administration of the survey, a pharmacist-initiated SMBG intervention will be conducted with the patient. Components of the intervention will include education about the importance of SMBG, how to recognize symptoms of low and high blood sugar, goals when testing blood sugar, and what to do when a blood sugar reading is not at goal. The pharmacist will also help the patient find an appropriate blood glucose monitor, if necessary. Two months after the initial intervention, the original survey will be administered to patients in the study to assess any changes that have occurred.

Preliminary Results:
Data analysis will be conducted using SPSS to assess stated outcomes. Hypothesized outcomes include improvement of patients blood glucose monitoring behaviors, knowledge, and satisfaction. This study will benefit patients by educating them about the importance of SMBG to help control their diabetes and improve their overall health.

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Learning Objectives:

Recognize barriers influencing SMBG in diabetic patients.

Identify what are the appropriate fasting (no food/drink within the past 8-12 hours) and post-prandial (1-2 hours after a meal) blood glucose level ranges for patients with diabetes based on American Diabetes Association (ADA) guidelines.

Self Assessment Questions:

What are some of the most common barriers that influence SMBG in diabetic patients?

What are considered normal fasting (no food/drink within the past 8-12 hours) and post-prandial (1-2 hours after a meal) blood glucose level ranges for patients with diabetes per ADA guidelines?

EVALUATION OF A STANDARDIZED PEDIATRIC ANTIMICROBIAL ORDER SET AT A FREE STANDING CHILDRENS HOSPITAL

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PURPOSE/BACKGROUND:
Hospitalized children are at high risk for medication errors with studies demonstrating error rates as high as 1 in 6.4 orders. Antimicrobials are the most frequently involved drugs accounting for up to 44% of medication errors. Antimicrobial ordersets (pediatric and neonatal) containing commonly used intravenous antimicrobials were developed and made available for use at Riley Hospital for Children in January 2009. Use of the ordersets is prescriber dependent with prescribers still able to choose to use the standard orderset or a blank physician orderform when prescribing intravenous antimicrobials. The purpose of this study is to compare the rates of prescribing errors for antimicrobials ordered with and without the standardized antimicrobial orderset.

METHODS:
A prospective study of initial orders for target intravenous antimicrobials will be conducted over a period of 90 days. Orders will be categorized into two groups: non-orderset and orderset. Subjects will be assigned to the non-orderset or orderset group by prescriber discretion based upon how the prescriber chooses to write the antimicrobial order. Demographic data includes age, weight, height, patient location, and renal function. Antimicrobial specific data includes selection, dose, frequency, and indication. Outcome measures to be evaluated include rates of prescribing errors for intravenous antimicrobials ordered via blank physician order form and via standardized antimicrobial orderset. Categories of prescriber errors will be delineated. Error rates for the two groups will be compared using chi-square analysis. P-values of less than 0.05 will be considered to be statistically significant.

RESULTS/CONCLUSION:
Results are to follow pending completion of data collection and analysis.

Learning Objectives:

Describe the high incidence of antimicrobial medication errors in pediatric patients.

Identify the use of an antimicrobial orderset as a valid way to reduce dosing and medication errors in pediatric patients.

Self Assessment Questions:

True/False: Use of an antimicrobial orderset is a way of reducing dosage and medication errors in pediatric patients.

Antimicrobial medication errors can happen in pediatric patients from?
a. Incorrect dosing especially in the neonatal population
b. Use of a suboptimal antimicrobial therapy based on microbiology data
c. Physician ordering
d. All of the above

TARGETING HIGHER VANCOMYCIN TROUGH LEVELS IN NEONATES

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Background:
Vancomycin is frequently used to treat suspected or confirmed Gram-positive bacterial infections in the neonatal intensive care unit (NICU). Historically, doses were adjusted to attain trough levels of 5-15 mcg/mL. The American Society of Health-System Pharmacists, Infectious Diseases Society of America, and Infectious Diseases Society Pharmacists recently released a consensus statement on use of vancomycin in adults which suggested targeting trough levels of 10-20 mcg/mL to aid in reducing resistance and potential treatment failure. Some clinicians have begun targeting these higher vancomycin trough levels in pediatric patients while continuing to use standard empiric dosing. Research has shown that the current dosing recommendations do not consistently attain troughs of 10-20 mcg/mL in older pediatric patients and there is less documentation in neonates. The goals of this study are to develop an empiric dosing regimen in neonates most likely to achieve vancomycin trough elvels of 10-20 mcg/mL and determine whether these higher troughs are safe.

Methods:
Retrospective chart review of all patients receiving at least one vancomycin trough level while admitted to the NICU at Nationwide Children's Hospital between January 2008 and December 2009. Data collected includes: gestational age at birth, postnatal age and corrected gestation age at time of vancomycin administration, weight, initial vancomycin dose and interval, vancomycin trough levels, changes to dose or interval based on trough levels, BUN and creatinine (initial, final, and peak during treatment), and concurrent nephrotoxic agents. Based on data collected, new neonatal vancomycin dosing guidelines will be developed and implemented. Prospective analysis will then be used to evaluate the safety of targeting higher levels in neonates. Safety data to be collected includes: changes in creatinine and incidence of vancomycin levels greater then 20 mcg/mL.

Results and Conclusions:
To be presented at Great Lakes Residency Conference

Learning Objectives:

Discuss the implications of the adult vancomycin guidelines on the use of vancomycin in neonates

List the proposed benefits of targeting higher vancomycin trough levels

Self Assessment Questions:

True or False: Evidence based-medicine dictates the use of higher vancomycin trough levels in pediatric patients.

True or False: The standard dosing regimen of vancomycin 40-60 mg/kg/day will consistently attain levels of 10-20 mcg/mL.

EFFECT OF CPAP ON DIABETES CONTROL IN PATIENTS WITH OBSTRUCTIVE SLEEP APNEA AND POORLY CONTROLLED TYPE 2 DIABETES

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PURPOSE:
The purpose of this retrospective study is to evaluate the impact of treatment with continuous positive airway pressure (CPAP) on diabetes control in patients with poorly controlled type 2 diabetes and severe obstructive sleep apnea (OSA).

METHODS:
This study is a retrospective chart review of patients with poorly controlled type 2 diabetes and OSA newly initiated on CPAP therapy. The primary endpoint is change in hemoglobin A1c. Secondary endpoints include changes in diabetes medications (dose and oral versus insulin regimens), fasting blood glucose, and self-monitored blood glucose readings. Secondary analyses will consider the impact of CPAP on hemoglobin A1c based on baseline hemoglobin A1c, apnea-hypopnea index (AHI), use of insulin prior to study initiation, and presence of metabolic syndrome. Patients starting CPAP from January 2007 through March 2009 will be included in this chart review. Patients will also be included if they are over 18 years old, have a HgbA1c > 8%, and have an AHI>20. Data including glycosylated hemoglobin A1c, fasting blood glucose, body-mass index, and diabetes-related medications will be collected at baseline and at the time of the first hemoglobin A1c available at least three months after the start of CPAP therapy. Data concerning compliance with CPAP will also be collected.

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

Learning Objectives:

Define apnea-hypopnea index (AHI) and describe how it relates to sleep apnea severity.

Explain the rationale for the hypothesized connection between obstructive sleep apnea and blood glucose control.

Self Assessment Questions:

What is the prevalence of obstructive sleep apnea in patients with diabetes?

Insulin resistance in obstructive sleep apnea may be related to which of the following?
a. visceral fat
b. increased sympathetic drive related to frequent arousals and sleep fragmentation
c. increased sympathetic drive related to hypoxia
d. all of the above

ESTABLISHMENT OF PHARMACIST-MANAGED DYSLIPIDEMIA SERVICE AT A FAMILY MEDICINE CLINIC

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PURPOSE: The goals of this project are to design and implement a collaborative drug therapy management (CDTM) agreement for pharmacotherapy management by a clinical pharmacist at a family medicine clinic (FMC). The CDTM would allow qualified pharmacists to perform patient assessments, order drug therapy-related laboratory tests, administer medications as well as select, initiate, monitor, continue, and adjust drug regimens under the provisions specified in the established protocol. Reimbursement for pharmacy services provided under this agreement will be pursued.

METHODS: Using the American College of Clinical Pharmacy criteria for establishing an effective CDTM agreement, a protocol for a pharmacist-managed dyslipidemia clinic was established. This protocol allows the clinical pharmacist at the FMC to provide a consultative service in the clinic that includes, but is not limited to, management of dyslipidemia therapy, assessment of patients for complications related to dyslipidemia therapy, and provision of comprehensive and ongoing education to patients and/or caregivers. After physician agreement with this protocol was obtained, billing and reimbursement opportunities for this service were investigated and pursued.

RESULTS AND CONCLUSION: To be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Explain the role of pharmacy services under a collaborative drug therapy management agreement.

Identify the steps necessary to setup and run an effective pharmacy-managed service in the ambulatory care setting.

Self Assessment Questions:

Which of the following is (are) permitted by the pharmacist through a collaborative drug therapy management?
a.Administer medications
b.Initiate medication regimen
c.Order drug therapy-related laboratory tests
d.Perform physical assessments
e.All of the above

True or False: Pharmacists are able to bill for the services provided through a collaborative drug therapy management agreement.

THROMBOEMBOLIC EVENTS ASSOCIATED WITH RECOMBINANT FACTOR VIIA ADMINISTRATION

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In 1999, the U.S. Federal Food and Drug Administration approved the use of recombinant Factor VIIa (RFVIIa) for the management of hemophilia and congenital Factor VIIa deficiency. Since its approval, RFVIIa has been used in non-hemophiliac patients to help manage acute hemorrhages and reversal of anticoagulation, but the safest and most efficacious dosage is unknown. As the utilization of this agent has increased, concerns regarding the incidence of thromboembolic complications in non-hemophiliac patients have been reported. A previous evaluation of RFVIIa conducted at The Ohio State University Medical Center (OSUMC) strengthened the concern for thromboembolic complications, both arterial and venous, and guidelines for the dosing of RFVIIa were revised. The purpose of this study is to determine if the dosage recommended in the guidelines is being followed and the incidence of thromboembolic complications associated with the use of RFVIIa after the implementation of these changes in non-hemophiliac patients. The secondary outcomes include 30-day survival and comparing data from the previous evaluation of RFVIIa conducted at the OSUMC.

A retrospective chart review will be conducted in patients who were admitted to the OSUMC from September 1, 2008 to August 31, 2009 and received RFVIIa. Exclusion criteria include patients less than 18 or greater than 89 years of age, pregnancy, incarceration, and hemophiliac patients. The data to be collected includes demographics (age, weight, height, and gender), indication for use, history of thrombosis, hematologic studies, pertinent baseline medications, transfusions, use of hemostatic medications, and evidence of ischemia on electrocardiograms or thrombosis on radiologic or ultrasound tests. The data will be collected from patient charts, OSUMCs electronic medical records (eResults), and the Critical Care electronic charting system (Essentris).

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

Learning Objectives:

Discuss the indications for use and dosing of recombinant Factor VIIa at The Ohio State University Medical Center.

Explain the complications in non-hemophiliac patients after the revision of RFVIIa dosing guidelines.

Self Assessment Questions:

Which of the following are potential complications associated with the use of recombinant Factor VIIa?

What are some factors that should be considered prior to starting recombinant Factor VIIa therapy for non-FDA approved indications?

INCREASING THE EFFECTIVENESS OF ADVERSE DRUG EVENT AND MEDICATION ERROR DETECTION THROUGH THE IMPLEMENTATION OF A RETROSPECTIVE "TRIGGER TOOL" MECHANISM.

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Purpose: Adverse drug events and medication errors cause significant harm to patients and are costly to the healthcare system. Detection of these adverse events and medication errors allows healthcare organizations to retrospectively assess their medication administration processes. The voluntary system for reporting of medication errors and adverse drug events by hospital pharmacists can be improved to increase the number of medication event reports received. Literature has shown that a trigger-tool system properly designed to signal a pharmacist to initiate a more in-depth review of the patients chart is an efficient way to identify medication events. The primary objective of this project is to implement a system for increasing the rate of adverse drug event and medication error reporting utilizing computerized trigger tools for the purpose of analyzing the medication-use systems in our organization.

Methods: A review of the current literature was conducted to determine the current utilization of trigger tool processes and guidelines from national organizations. An initial list of triggers was determined utilizing this published literature and taking into account the frequency, feasibility, and clinical importance of each potential trigger. Hospital information technology personnel were contacted regarding the feasibility and a potential timeline for programming changes that may be requested. A standard metric was determined to compare the rate of adverse drug event and medication error reporting before and after the implementation of this project. The author collected initial data regarding the frequency of trigger firing and the amount of time required to analyze the triggers. The project was implemented across an initial hospital, in order to determine if further adjustments needed to be made to the list of triggers or process. The project will be considered for implementation across all Aurora Health Care hospitals.

Results/Conclusion: Data collection is in progress; results and conclusions will be presented at Great Lakes Residency Conference.

Learning Objectives:

Describe how information technology can be used to increase the rate of adverse drug event and medication error reporting.

Identify medications that may be used as "triggers" to increase the rate of adverse drug event and medication error reporting.

Self Assessment Questions:

A "trigger tool" system can improve the detection rate of adverse drug events and/or medication errors. T F

What are three medications that could be used as "triggers" to identify potential medication events?

EVALUATION OF A PHARMACIST-DRIVEN DIABETES MANAGEMENT SERVICE AT A VETERANS AFFAIRS COMMUNITY LIVING CENTER

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Purpose: Diabetes mellitus is a common chronic disease for many elderly persons in the U.S. and a cause of considerable comorbidity. The most recent report from the NIH (2007) showed that some 12.2 million or 23.1% of Americans 60 years old and above are diagnosed with the condition. A pharmacist-driven diabetes management service at the Lexington, KY VAMC was established in October 2009 to aid in the management of patients with this condition. The objective of this study is to compare care under the pharmacist-driven service with that of the previous practices.

Methods: To assess the performance of the pharmacist-driven diabetes management service a retrospective, non-randomized, observational, single-center review will be performed. Patients eligible for review will be identified from the computerized patient record by running a report for agents from VA drug-class HS501 (insulins) administered at the community living center. The pharmacist-managed group will consist of the patients from the aforementioned report with dates of admission from 11/1/2009 to 2/28/2010, and the usual care or pre-intervention group will be those patients with dates of admission from 6/1/2009 to 9/30/2009. These patients will be excluded from review/inclusion in data analysis: Type I diabetic patients, length-of-stay <14 days, and hospice patients. Primary study endpoint will be glucose control as measured over the 14 day period immediately preceding discharge from the facility. Secondary endpoints including # of hypoglycemic events, # of provider alerts for critical values (blood glucose <70mg/dL or >400mg/dL), percentage of doses received, monitoring frequency appropriateness for regimen, insulin agent received by patient, # of PharmD recommendations made and accepted, and timeliness of recommendation implementation will be reported for total length of stay. Statistical analyses will be performed using t-test for continuous data, Chi-squared or Wilcoxon-Rank Sum as appropriate for number of data points for categorical data.

Conclusions: Pending

Learning Objectives:

Discuss the impact of a clinical pharmacist in a disease state with potentially high-risk drugs.

Describe the factors that increase risk of hypoglycemia in the elderly population.

Self Assessment Questions:

What are some of the factors contributing to increased risk of hypoglycemia in the elderly population?

Although the long-term benefits of proper glucose management are well known, what are some important acute benefits to maintaining glucose control, especially in a geriatric population?

IMPACT OF THE ADDITION OF PEPTIDE NUCLEIC ACID FLUORESCENCE IN SITU HYBRIDIZATION (PNA FISH) TO FLUCONAZOLE SUSCEPTIBILITY TESTING ON TIME TO OPTIMAL ANTIFUNGAL THERAPY FOR CANDIDEMIA.

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Candida blood stream infections (BSIs) are an important cause of mortality and morbidity in hospitalized patients. Delays in the initiation of appropriate antifungal therapy result in higher Candida-related mortality. Although C. albicans is usually susceptible to fluconazole, which is the most commonly utilized empiric antifungal at our institution, approximately 20 percent of all BSIs are caused by C. glabrata; of these, only 33 percent are fully susceptible to fluconazole. The University of Michigan Health System (UMHS) introduced fluconazole susceptibility testing of C. glabrata in June 2008 and PNA FISH, a rapid 2.5 hour in vitro test used to differentiate between C. albicans and C. glabrata, in October 2008. The purpose of this study is to determine if the addition of C. glabrata fluconazole susceptibility testing and PNA FISH for C. albicans and C. glabrata decreases the time to optimal antifungal therapy in Candida BSIs.

All blood cultures initially positive for Candida will be identified. The time from the original blood culture draw to the time of initiation of optimal antifungal therapy will be determined for BSIs during three six-month time periods: (1) prior to the availability of C. glabrata fluconazole susceptibility testing and prior to the PNA FISH, (2) after the availability of C. glabrata fluconazole susceptibility testing but prior to the introduction of PNA FISH, and (3) after the introduction of both C. glabrata fluconazole susceptibility testing and PNA FISH. The primary endpoint of time to optimal antifungal therapy will be evaluated by survival analysis. This study will help to validate the use of PNA FISH and C. glabrata fluconazole susceptibility testing for Candida BSIs or to identify the need for the implementation of an intervention at the time of PNA FISH and/or fluconazole susceptibility results.

Learning Objectives:

Discuss the clinical significance of C. albicans compared to C. glabrata bloodstream infections.

Explain how PNA FISH is utilized in candidemia.

Self Assessment Questions:

You have a patient on empiric fluconazole therapy for a suspected candidemia. The culture returns positive for yeast and the speciation returns C. glabrata. Now you are awaiting fluconazole susceptibilities. Which of the following is the MOST correct?
a.Recommend to continue with fluconazole therapy since C. glabrata resistant to fluconazole is extremely rare.
b.Recommend to continue with fluconazole therapy since C. glabrata is commonly resistant to echinocandins.
c.Recommend to switch to amphotericin B since there are no other options for C. glabrata treatment due to high resistance rates to azoles and echinocandins.
d.Recommend to switch to micafungin since there is a risk for fluconazole resistance, but little risk for resistance to echinocandins.

You have a patient in the ICU on an echinocandin for a suspected fungal bloodstream infection. The PNA FISH result returns with the following results: Neither C. albicans or C. glabrata. Which of the following statements is MOST correct?
a.The pathogen is most likely not a Candida species
b.Recommend continuing with echinocandin therapy until species identification is complete since it is most likely to be a fluconazole-resistant species of Candida
c.Recommend a change to fluconazole since the isolate is likely to be susceptible to fluconazole
d.Recommend discontinuation of antifungal therapy since the patient does not have a fungal infection

EVALUATION OF A HYDROCHLOROTHIAZIDE DOSAGE INCREASE IN A VETERAN POPULATION

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Purpose: Hydrochlorothiazide (HCTZ) is one of the most commonly used medications in the United States for hypertension. The target dose of HCTZ for optimal BP control with the least incidence of adverse effects has not been firmly established in the literature. Our goal is to identify what percentage of patients benefit from a dosage increase of HCTZ from 25mg to 50mg daily and ascertain any factors which lead to an improvement in blood pressure control. The rate of adverse effects will also be examined to see if there is any correlation between the rate of side effects, dose, and patient specific data.

Methods: This study is a retrospective chart review of patients converted from HCTZ 25mg to HCTZ 50mg daily. Patients who achieved blood pressure lowering of 5 mmHg systolic blood pressure (SBP) or greater or patients who achieved BP goals (as defined by JNC-7 guidelines) will be identified and will form a cohort of responders, which will be compared with a non-responder group of patients who did not see this benefit. A review of adverse events (including serum creatinine increase of greater than 30%, sodium level falling to less than 134mmol/L, potassium level falling to less than 3.5mmol/L, or symptomatic side effects/adverse events documented in the medical record) will also be conducted. A comparison between groups of age (less than 50 years, 50-60 years, 60-70 years, 70-80 years, and greater than 80 years), race (Caucasian and non-Caucasian), gender, stage of hypertension (prehypertension, Stage I and Stage II), Stage of CKD (based on eGFR determined by MDRD equation), number of concurrent antihypertensive medications, concurrent ACE-inhibitor or ARB use, and diagnosis of diabetes mellitus will be compared between groups and examined for trends.

Results: Data collection is currently in progress. The results and conclusions of this study will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Describe the role of hydrochlorothiazide in the management of hypertension, including dosage increases from 25mg to 50mg.

Evaluate the incidence of adverse effects caused by high dose HCTZ therapy.

Self Assessment Questions:

Which is not a common adverse effect of hydrochlorothiazide?
a)Hyperkalemia
b)Hyperglycemia
c)Hyponatremia
d)Renal impairment

True or False: Hydrochlorothiazide is the drug of choice for hypertension in patients with a lack of a compelling indication for another agent.

INTRAVENOUS CORTICOSTEROIDS IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE EXACERBATIONS: A DOSE COMPARISON STUDY

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Purpose:
Chronic obstructive pulmonary disease (COPD) affects approximately 16 million Americans and is the fourth leading cause of death in the United States. Current guidelines recommend the use of systemic corticosteroids for treatment of a COPD exacerbation to shorten recovery time, improve lung function and hypoxemia. The purpose of this study is to review the usage of intravenous (IV) corticosteroids(CS) in patients admitted for a COPD exacerbation. The primary outcomes of this study are to evaluate whether higher initial doses of IV CS affected length of hospital stay and time to de-escalation of CS to an oral dosage form. The secondary outcomes are in-house mortality, need for increased level of care (e.g. transfer to ICU) and readmission to Cabell Huntington Hospital (CHH) within 90 days of discharge with a COPD exacerbation. The hypothesis of this study is there will be no difference in primary outcomes between different initial dosing regimens of IV CS.

Methods:
A retrospective chart review using patients who were hospitalized at CHH with a COPD exacerbation and who received IV methylprednisolone (Solu-Medrol) during 2009 will be performed. Initial IV CS regimen and subsequent modifcations made to the CS regimen will be evaluated. Additional data to be collected includes home COPD medications, smoking history, length of hospital stay, in-house mortality, oxygen saturation levels, oxygen delivery modalities, and need for increased level of care. Potential benefits of this study include improved patient outcomes, decreased length of hospital stay, and decreased cost for both the patient and the hospital.

Results:
A report of all patient encounters where IV methylprednisolone was ordered in 2009 is currently being evaluated to determine which patients were admitted with a COPD exacerbation.

Conclusions:
Research is in progress at this time and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Describe the role of corticosteroids in the treatment of a chronic obstructive pulmonary disease exacerbation.

Discuss the side effect profile or corticosteroids and how this relates to dose and duration of therapy.

Self Assessment Questions:

Oral corticosteroids have low bioavailability
(a)True
(b)False

Chronic obstructive pulmonary disease has been linked to:
(a)Cigarette smoking
(b)Alpha-1 antitrypsin deficiency
(c)Occupational exposure to certain gases or fumes
(d)Significant exposure to secondhand smoke or pollution
(e)All of the above

EVALUATION OF OSTEOPOROSIS IN PROSTATE CANCER PATIENTS ON ANDROGEN DEPRIVATION THERAPY

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Background:
Prostate cancer is the most common cancer in men. It is the second leading cause of death from cancer in American men. Current prostate cancer treatments include radiation, prostectomy, or androgen deprivation therapy (ADT), which includes chemical, such as gonadotropin-releasing hormone agonists (GnRH-agonists), or surgical hormonal deprivation, such as orchiectomy. One side effect of ADT is osteoporosis. Osteoporosis itself is the leading cause of morbidity and mortality in the elderly population. One complication from osteoporosis includes osteoporosis related fractures from a reduced bone mineral density (BMD). The correlation between a reduced BMD while on ADT and resultant fractures is not well defined.

Purpose:
The purpose of this retrospective study is to evaluate osteoporosis in men with prostate cancer receiving ADT.

Methods:
This retrospective study examines the Jesse Brown VA Medical Center prostate cancer patients on androgen deprivation therapy. Subjects were included if they received ADT via orchiectomy or a GnRH-agonist (Goserelin). A computerized list of all patients on Goserelin from January 1, 1995 through October 31, 2008 was generated. A report of all orchiectomy patients between this time frame was generated to include patients on surgical hormonal deprivation. The following information will be gathered for this research: Age, weight, body mass index, race, dates of ADT, bone mineral density via dual energy x-ray absorptiometry (DEXA), fracture history via x-ray, metastatic prostate evidence, and evaluation of medical profiles to verify confounding factors of or treatment for osteoporosis.

Results/Conclusion:
Data collection is currently in progress. All results and conclusions will be presented at the conference.

Learning Objectives:

Discuss the prevalence and incidence of osteoporosis in men

Discuss and promote the monitoring of bone loss and fractures in prostate cancer patients with androgen deprivation therapy

Self Assessment Questions:

Androgen deprivation therapy has not been shown to induce osteoporosis related fractures. T or F

Osteoporosis screen should be done in patients receiving androgen deprivation therapy. T or F

ROLE OF COMMUNITY PHARMACISTS IN MEDICATION MANAGEMENT OF HIV PATIENTS

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Purpose: There is a current lack of data on how community pharmacists can help optimize medication management for HIV patients. The purpose of this study is: to examine HIV patients knowledge of and compliance with their medications and to assess HIV patients perceived benefits toward pharmacist managed medication therapy management (MTM) services in the community setting.

Methods: The research study is a prospective, survey based study conducted in a grocery chain pharmacy. Patients ≥ 18 years of age and who have received at least 1 antiretroviral therapy prescription in the last 6 months for HIV treatment are eligible to be included in the research. Selected pharmacists will participate in the recruitment of potential patients at their community pharmacy practice sites and assist with survey distribution at the time patient presents with a new or refill prescription. This survey will assess patients: treatment compliance, knowledge of their therapy, confidence level in management of their medications, and perception of benefits from various HIV services that can be provided by community pharmacists. Eligible patients who consent for research participation by completing the survey will return completed surveys in a sealed envelope to the pharmacist and receive a $10 store gift card for participating in the research. Anonymous surveys will be collected and analyzed by the principal investigator only.

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

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Learning Objectives:

Discuss the current HIV epidemic in the United States.

Identify the various complications that may occur with the use of an ART regimen.

Self Assessment Questions:

What is combined antiretroviral therapy (ART)?
a. Protease inhibitors + Nonnucleoside Reverse Transcriptase inhibitors (NNRTI)
b. Protease inhibitors + Nonnucleoside Reverse Transcriptase inhibitors (NNRTI) + Antibiotic
c. Protease inhibitors + Nonnucleoside Reverse Transcriptase inhibitors (NNRTI) + Nucleoside Reverse Transcriptase Inhibitors (NRTI)
d. Protease inhibitors + Nucleotide Reverse Transcriptase Inhibitors (NtRTI)

True or False: Once HIV replication is suppressed, patients infected with HIV will no longer need to continuously take ART.
A. True
B. False

ENHANCING THE INPATIENT TO OUTPATIENT TRANSITION FOR HEART FAILURE AND COPD

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Purpose:
Rehospitalizations for heart failure and chronic obstructive pulmonary disease (COPD) are enormous burdens on the United States healthcare system. Recently discharged patients are particularly at risk for increased health care resource utilization due to medication-related issues. Lack of follow-up, drug therapy monitoring, and patient education may all be factors for rehospitalization in this patient population. The objective of the study is to describe the impact of a pharmacist discharge and follow-up program on hospital resource utilization in patients with heart failure and COPD.

Methods:
This is a 100 patient, prospective pilot study evaluating the impact of a pharmacist discharge and follow-up program on healthcare resource utilization in patients admitted for heart failure or COPD exacerbations. Interventions performed by the pharmacist will include clarifying medication discrepancies at hospital discharge, providing early follow-up, drug therapy monitoring, and the development of patient-specific symptom triggered action plans. Inclusion criteria are adult (≥18 years old) patients admitted for heart failure or COPD exacerbations onto two internal medicine units. Patients discharged to skilled nursing facilities or places other than home will be excluded. Rehospitalization rates and emergency department visits within 30 days of discharge, length of stay during readmissions, medication compliance, and the frequency of outpatient phone calls to the call center concerning medications will be analyzed.

Results and Conclusions:
This study is currently pending Institutional Review Board approval. Preliminary results will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Describe factors associated with hospital rehospitalizations in heart failure and COPD patients

Describe the impact of a pharmacist discharge and follow-up program on hospital resource utilization in patients with heart failure and COPD.

Self Assessment Questions:

True or False: Lack of timely follow-up after hospital admission has been associated with an increase in 30-day rehospitalization rate for patients admitted for heart failure or COPD exacerbation.

True or False: Pharmacist involvement in hospital discharge and outpatient follow-up may play a role in improving transitional care for patients.

DEVELOPMENT OF AN EDUCATIONAL GUIDE FOR PHARMACISTS TRANSITIONING FROM THE COMMUNITY TO HOSPITAL PHARMACY SETTING

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Purpose: Numerous pharmacists in the course of their career transition from one pharmacy practice setting to another. This transition almost always requires the learning of an array of new knowledge and skills and, thus, can be challenging. The primary objective of this study is to identify the need for training and to develop an educational guide to assist with the transition of pharmacists from a community to hospital pharmacy setting.

Methods: A web-based survey was distributed via e-mail to hospital pharmacy managers and pharmacists throughout the United States. Pharmacists who made the transition to hospital pharmacy from the community setting and pharmacy managers who have been involved in the training/orientation of such pharmacists were requested to participate in the survey. Information collected in the survey from pharmacists included the length of time they worked in the community setting, their reason for making the transition to hospital setting, the challenges they faced in the process, and what kind of training they received. Information collected in the survey for pharmacy managers included the challenges they faced when training pharmacists new to the hospital setting and the structuring of their training program. Input on the topics for inclusion in the training guide was also requested in both surveys. Areas of education will be identified and prepared for inclusion in the guide.

Results and Conclusions: Data collection is currently ongoing. Results of the survey and guide content will be presented at GLPRC in April. Areas of education for the guide include Joint Commission regulations, USP 797, drug information, drugs in critical care/surgery, and others.

Learning Objectives:

Discuss the need for training pharmacists who transition from community to hospital pharmacy setting.

Identify the significance of an educational guide in assisting with the transition of pharmacists from community to hospital pharmacy setting.

Self Assessment Questions:

True/False: The transition from community to hospital pharmacy is challenging for pharmacists.

True/False: An educational guide may be a useful tool to ease the transition of pharmacists from the community to hospital pharmacy setting.

EVALUATION OF VETERANS ON WARFARIN FOR ATRIAL FIBRILLATION: OUTCOMES ASSOCIATED WITH AND WITHOUT BRIDGE THERAPY FOR SUBTHERAPEUTIC INTERNATIONAL NORMALIZED RATIO (INR)

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Background: Atrial fibrillation (AF) is an independent risk factor for ischemic stroke/transient ischemic attack (TIA). Warfarin anticoagulation therapy is effective in lowering stroke/TIA risk in patients with AF. With the risk of thromboembolic complications associated with a subtherapeutic INR (INR< 2.0), providers may choose to bridge with low molecular weight heparin (LMWH). Data is limited supporting bridge therapy in AF patients for an isolated subtherapeutic INR and may lead to increased risk of bleed and higher costs.

Purpose: The purpose of this study is to review outpatient management of an isolated subtherapeutic INR in AF patients at Jesse Brown VA Medical Center (JBVAMC). This study will compare outcomes (bleed vs. stroke/TIA) in patients who are bridged and not bridged.

Methods: This is a retrospective, electronic chart review of veterans at JBVAMC with an ICD 9 code for the diagnosis of AF and an active outpatient prescription for warfarin between October 1, 2007 and September 14, 2009. Included patients will have at least two consecutive therapeutic INRs (between 2.0 and 3.0) at the same warfarin dose with at least one subsequent subtherapeutic INR (<2.0) during that time period. These patients will be stratified by high, moderate, or low stroke/TIA risk based on a CHADS2 score. Risk groups will be subdivided into bridged and non-bridged and evaluated for bleed, stroke/TIA, and mortality within 14 days post subtherapeutic INR. Exclusions are as follows: anticoagulation indications aside from AF, INR goal other than 2.0-3.0, prescribed interruption of warfarin therapy, insufficient medical history to calculate a CHADS2 score, non-adherence to prescribed bridge medications shown by chart documentation or refill history, LMWH use for veterans newly started on warfarin for AF, and peri-operative use of LMWH.

Results/Conclusions: This study is currently in the data collection phase. Final results with conclusions will be presented at the Great Lakes Pharmacy Conference.

Learning Objectives:

Identify the factors that make up a CHADS2 score for a patient diagnosed with atrial fibrillation and how this score correlates with risk groups

Discuss the risk vs. benefit when bridging atrial fibrillation patients for an isolated subtherapeutic INR

Self Assessment Questions:

True or False. Atrial fibrillation is an independent risk factor for ischemic stroke/transient ischemic attack.

True or False. There is strong evidence to support bridging with low molecular weight heparin in all patients with an isolated subtherapeutic INR while being anticoagulated with warfarin for atrial fibrillation.

CLINICAL TELEPHARMACY PILOT STUDY: PROVIDING CLINICAL SERVICES TO PATIENTS WITH CHRONIC CONDITIONS IN RURAL AREAS OF KENTUCKY: THE ROLE OF THE DRUG INFORMATION SERVICE AND PHARMACIST.

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Purpose: To study the benefits of Medication Therapy Management (MTM) services as conducted through Clinical Telepharmacy.
Background: Kentucky is a state with a great portion of the population residing in rural area, as well as medically underserved areas. In these rural areas of Kentucky, there is higher prevalence of chronic diseases such as hypertension, diabetes, and COPD. The mission of this study was to evaluate the effectiveness of clinical Telepharmacy services in improving the patients quality of life and decreasing health-related costs.
Methods: Patients seen at this clinic are referred to the pharmacist for clinical Telepharmacy services if they are 18 years of age, using 2 or more maintenance medications, or suffering from one or more chronic diseases. After referral by the primary care provider, patient medical records are securely faxed to an off-site pharmacist in the Drug Information Center. The medical record is examined for any adverse drug reactions (ADRs), medication-related problems (MRPs), duplication of therapy, all interactions (including drug-drug, drug-disease, drug- food, and drug-herbal), and appropriateness of therapy (adherence to practice guidelines). A teleconferencing appointment is set up with the patient for live counseling session. Pharmacist interventions are documented using a specific program, and all actions/recommendations are communicated to the primary care provider. Follow up appointments are scheduled with patient to monitor progress. Study endpoints include the correction of MRPs, the treatment of ADRs, cost-savings based on recommendations, and improvements in overall quality of life.
Summary of Preliminary Results: The study and data collection is in progress and will be presented at the conference along with the preliminary results.

Learning Objectives:

Explain the purpose and List the activities involved in Clinical Telepharmacy.

Differentiate between Clinical Telepharmacy and other models of Telepharmacy.

Self Assessment Questions:

1.Clinical Telepharmacy services involve the use of telecommunications to remotely provide what services?
a.Medication Therapy Management
b.Patient education
c.Medication dispensing
d.All of the above
e.A + B

2.Clinical Telepharmacy uses teleconferencing to speak face to face with a patient for what reasons?
a.Assess for ADRs
b.Assess for MRPs
c.Educate patient with regard to disease and medications
d.Assess patient understanding and compliance
e.All of the above

VENOUS THROMBOEMBOLISM INCIDENCE IN AMBULATORY PATIENTS: WHICH RISK FACTORS CONTRIBUTE TO SEASONAL VARIATION?

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PURPOSE:
Several studies claim that venous thromboembolism (VTE) incidence exhibits seasonal periodicity. In contrast, others failed to find any variation. However, differences in study population risk factors have not been evaluated and hence, may explain these contradictions. We therefore sought to determine if seasonal VTE variation occurred in an ambulatory patient population in whom the influence of demographics and specific risk factors was examined.

METHODS:
We performed a retrospective chart review of patients presenting to Detroit Medical Centers emergency departments with suspected VTE from 2004 to 2008: identified from VTE-specific ICD-9 codes. We excluded in-hospital VTE cases. VTE was confirmed by CT-scan or duplex sonography. We collected demographic data from patients electronic medical records and also recorded patients comorbidities, VTE location, and month of event. We plotted VTE-event frequency as a function of month for the entire population and for several subgroups based on potential risk factors: specifically, demographic variables such as ethnicity, gender, age, body mass index above and below 30kg/m2, and also significant non-idiopathic risk factors including previous VTE, malignancy, and recent surgery/trauma. In all analysis, we compared the observed distributions to a uniform monthly distribution using Kuipers test - designed to compare periodic data.

RESULTS:
We identified 618 VTE cases: 47% male, 72% African American, 28% white. Our analysis revealed no seasonal variation in VTE for the entire population or for almost all of the subgroups: consistent with uniform monthly distributions. In contrast, the VTE-frequency distribution for patients with malignancies and, or, recent surgery/trauma (32% of total population) differed from uniform distribution ($P<0.01$), with a spring/summer peak.

CONCLUSION:
Ambulatory patients with malignancy and, or, recent surgery/trauma appear at greatest risk of VTE in the spring/summer. Although the reasons for this are unknown, our observation suggests that VTE awareness should be heightened for this group between April and August.

Learning Objectives:

Discuss the various risk factors for VTE

Identify possible mechanisms that may contribute in VTE seasonal variation

Self Assessment Questions:

What are the possible mechanisms of how malignancy contributes to the risk of VTE?
a)Heightened hypercoagulable state due to activation of the coagulation cascade by malignant cells.
b)Chemotherapy leading to endothelial disruption.
c)Use of erythropoiesis-stimulating agents and white blood cell growth factors.
d)Two of the above are true
e)All of the above are true

True or False: Patients with malignancy or recent surgery have an increased risk of VTE between April and August.

AN EVALUATION OF CONTINUOUS INFUSION REMIFENTANIL IN CRITICALLY ILL PATIENTS

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Purpose: Published literature has demonstrated the benefits of using continuous infusion remifentanil (Ultiva) in mechanically-ventilated patients who require analgesia-based sedation. Remifentanil is a short-acting mu-opioid receptor agonist with both analgesic and sedative effects. Currently, remifentanil is FDA approved as an analgesic agent for use during the induction and maintenance of general anesthesia and for the continuation of analgesia during the post-operative period. Beneficial pharmacologic properties of remifentanil include rapid onset and offset of action, lack of active drug and metabolite accumulation, comparable hemodynamic effects to that of other opioids, widespread extravascular metabolism and absence of tolerance. Additional benefits of continuous infusion remifentanil in patients with brain injuries include shorter extubation time, comparable efficacy to other agents for analgesia-based sedation, and faster and more predictable awakening time for neurological assessment. In May 2009, continuous infusion remifentanil was approved by the Pharmacy and Therapeutics Committee at The Ohio State University Medical Center (OSUMC) for use in patients requiring frequent neurological assessment. A retrospective review on the current use of continuous infusion remifentanil in critically ill patients at OSUMC will be used to evaluate the agents current use and benefits.

Methods: A retrospective chart review was performed on all patients who were reported to have received continuous infusion remifentanil at OSUMC from May 2009 through January 2010. Baseline characteristics of patients were collected and included patients sex, age, ICU admission weight, presence of brain injury, diagnosis and assigned service. Dosing of remifentanil, duration of therapy, previous therapy, concurrent therapy, and reason for discontinuation were collected to evaluate the overall use of continuous infusion remifentanil. Changes in propofol and opioid dosing were also recorded and analyzed to evaluate the efficacy of continuous infusion remifentanil.

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

Learning Objectives:

Identify the benefits of using continuous infusion remifentanil over other sedative and analgesic agents

Identify patient populations who would be appropriate candidates to receive continuous infusion remifentanil

Self Assessment Questions:

1.According to published literature, which of the following is (are) benefits of using continuous infusion remifentanil in critically ill patients with brain injuries?
a.Shorter time to extubation
b.Comparable efficacy to other agents used in analgesia-based sedation
c.Faster and more predictable awakening time for neurological assessment
d.All of the above

Which of the following is false regarding the pharmacologic benefits of remifentanil?
a.Rapid onset and offset of action
b.Extensive hepatic metabolism
c.Absence of tolerance
d.Comparable hemodynamic effects with other opioids

EFFECT OF PHARMACIST INTERVENTION IN PATIENTS WITH POSITIVE PEPTIDE NUCLEIC ACID FLUORESCENT IN SITU HYBRIDIZATION (PNA FISH)

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Purpose: PNA FISH provides rapid identification of microbiologic organisms more quickly than standard methods. Literature has shown that this may be beneficial by decreasing medication costs and patients length of stay. PNA FISH has been implemented at BMC with test results being called to nursing. However, there was no pharmacist involvement to recommend therapy modification to physicians based on these results. The purpose of this study is to assess the impact of pharmacist intervention with PNA FISH results regarding mean patient length of stay in the hospital. The secondary endpoint assessed is the mean time to de-escalation or alteration of antimicrobial therapy.

Methods: This is a single center, retrospective, cohort study which includes all patients ages 18 and older admitted to BMC with a positive PNA FISH result from April 2009 through February 2010. Only the first episode of enterococcus, staphylococcus, or candida bacteremia per patient per admission are included. All positive results are called to a pharmacist for a possible intervention beginning November 2009.

Patients who have a positive gram stain and whose blood cultures are tested with PNA FISH were identified through the BMC laboratory. A pharmacist is notified of the PNA FISH results and will assess the patients current antibiotic regimen. If necessary, the pharmacist contacts the patients physician with recommendations. The data collected includes the following: age, gender, indication for treatment, time from culture draw to PNA FISH report, other organisms in blood culture, initial antimicrobial therapy, and total length of antimicrobial/antifungal treatment.

The mean length of hospital stay and time to de-escalation/modification of therapy will be compared using the two-sample t-test between patients who received pharmacist intervention versus patients who did not.

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

Learning Objectives:

Explain the significance of pharmacist involvement in using PNA FISH results to de-escalate antimicrobial therapy in a timely manner.

List the optimal antibiotic regimens for Enterococcus faecalis, Enterococcus faecium, Staphylococcus aureus, Coagulase negative staph, Candida albicans, and Candida glabrata.

Self Assessment Questions:

How can utilizing PNA FISH along with pharmacist intervention on antimicrobial therapy be beneficial in a hospital setting?

What are the advantages of de-escalating patients antimicrobial therapy based on PNA FISH results?

INCREASING ADVERSE DRUG EVENT REPORTING BY HOSPITAL PHARMACISTS

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Purpose: A yearly departmental goal has been set to increase Adverse Drug Event (ADE) reporting by pharmacists to 15 per month. Over the past ten years, the ADE reporting rate has steadily decreased from 15 reports to 3 reports per month. Voluntary ADE reporting is the primary method of post-marketing drug safety evaluation used by the FDA, yet there is a worldwide trend of under-reporting by healthcare professionals. The purpose of this study is to determine the barriers pharmacists encounter when reporting ADEs in a hospital pharmacy setting, address those barriers, and increase ADE reporting. Within our current work system, barriers to ADE reporting can be found within policies, procedure, people, culture, or the ADE reporting tool.

Methods: A survey will be developed using data from a recently administered AHRQ Culture of Safety, published evidence, and informal pharmacist interviews. This survey will be administered to 30 staff pharmacists during the winter using a computer based survey tool to assess the departments perception of the greatest barriers to ADE reporting. Once the primary barriers are identified, an intervention will be tailored to fit the need. Implementation of the intervention will include education on the use of the ADE reporting form, and how the barriers will be overcome. Following a wash-out period, the number of ADE reports submitted by pharmacists will be collected for the two months to assess the impact of the intervention.

Results/Conclusions: Results determining ADE reporting barriers for pharmacists specific to this environment are pending, as are the results and conclusions from the intervention.

Learning Objectives:

To describe the major barriers cited by pharmacists for lack of ADE reporting

To identify a reportable ADE

Self Assessment Questions:

What is the most frequently cited primary reason in the literature for pharmacists failing to report ADEs?
a.Lack of incentive
b.Lack of initiative
c.Lack of time
d.Lack of education
e.Lack of exposure

A serious reportable ADE fits which requirement?
a.ADE resulted in death or was life-threatening
b.ADE resulted in hospitalization
c.ADE resulted in disability
d.ADE required intervention to prevent permanent impairment
e.All of the above

EVALUATION OF A VANCOMYCIN DOSING PROTOCOL AT A TERTIARY CARE MEDICAL CENTER.

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Purpose
Vancomycin is an antibiotic used extensively in hospitals to treat multi-drug resistant (MDR) gram positive bacterial infections. It also represents an important option in the treatment of infections in patients with beta-lactam allergies. Due to rising minimum inhibitory concentrations (MICs) and poor vancomycin penetration into certain tissues, adequate dosing is vital for treatment success. The purpose of this study is to evaluate the pharmacy-driven vancomycin dosing protocol employed at a tertiary care medical center.

Methods
This is an Investigational Review Board (IRB)-approved, prospective, observational study. All intravenous vancomycin dosing at the study hospital is performed by pharmacy using an approved protocol. This protocol utilizes the following patient information: site of infection, actual body weight, creatinine clearance, and age. Vancomycin drug levels are ordered by pharmacy as needed; interpretation of drug levels and subsequent dosing changes are also determined by pharmacy. Study investigators will evaluate all new vancomycin patients and determine inclusion or exclusion into the study. Patients aged 18 years or older initiated on intravenous vancomycin using the approved protocol are eligible for inclusion. Exclusion criteria are as follows: vancomycin protocol not used, erratic renal function, recent vancomycin use, or vancomycin levels not obtained. The primary end-point is time to therapeutic level. Study investigators will also evaluate included patients for the following characteristics: obesity, diabetes, trauma, and pregnancy. This data will be evaluated to determine if these patient characteristics have any affect on the success of the protocol. The incidence of protocol deviation, supratherapeutic vancomycin levels, and missed/incorrectly drawn levels (secondary end-points) will also be recorded in order to identify protocol or system inadequacies.

Results
Data collection is in progress.

Conclusions
Study conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Explain the importance of adequate vancomycin dosing.

List the patient characteristics that can potentially affect vancomycin levels.

Self Assessment Questions:

List two reasons why higher goal vancomycin trough levels are appropriate for certain infections.

T/F: Vancomycin 1 gm IV every 12 hours is an appropriate dose for all adult patients.

RETROSPECTIVE REVIEW OF THE TREATMENT OF HYPERTENSIVE EMERGENCY IN AN ACADEMIC MEDICAL CENTER EMERGENCY DEPARTMENT

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PURPOSE. An adult patient with hypertension has a 1-2% chance of experiencing a hypertensive crisis in their lifetime. The presence of end organ damage will define the crises as hypertensive emergency or hypertensive urgency. Hypertensive emergency is associated with acute end-organ damage that may encompass the central nervous system, the heart, the kidneys, or eclampsia in pregnancy. Appropriate medical management in hypertensive emergencies is essential to prevent reduced perfusion, infarction or ischemic events, or further end organ damage. The purpose of this study is to describe the treatment approaches for patients presenting with hypertensive emergency in an academic medical center emergency department.

METHODS. A single-center, retrospective study conducted through chart review of patients presenting to The University Hospital in Cincinnati, OH between January 2004 through December 2009 with a primary or secondary diagnosis of malignant hypertension. Patients were included in the study if their initial systolic blood pressure was > 179 mmHg and/or diastolic blood pressure was > 109 mmHg, were treated with an intravenous (IV) antihypertensive medication for greater than one hour or more than one IV push dose, and had evidence of end-organ damage. The primary outcome measures the mean arterial blood pressure reduction in the first hour of treatment and the overall blood pressure reduction six hours after initiation of treatment. Secondary outcomes will evaluate agent selection based on patients end organ damage at presentation, adverse events associated with treatment, and utilize the University HealthSystem Consortium database to compare agent selection with other institutions.

RESULTS. Data collection ongoing.

CONCLUSIONS. Pending data review and analysis.

Learning Objectives:

Outline appropriate treatment goals for patients with hypertensive emergency.

Identify an appropriate antihypertensive agent for a patient based on their end organ damage at presentation.

Self Assessment Questions:

According to JNC 7 Guidelines, the goal of treatment in hypertensive emergency is to reduce the mean arterial blood pressure by no more than ____ in the first hour.
a. 10%
b. 15%
c. 20%
d. 25%
e. 30%

Why is it important to have a controlled reduction in blood pressure in a hypertensive emergency?

ADHERENCE TO TREATMENT ALGORITHMS FOR THE MANAGEMENT OF CLOSTRIDIUM DIFFICILE-ASSOCIATED DISEASE (CDAD)

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Purpose
Clostridium difficile infections have increased in incidence and severity over the last 20 years and outbreaks of more virulent strains have been reported internationally. CDAD can result in increased morbidity and mortality as well as increased costs associated with treatment and infection control measures. Evidence based treatment algorithms have been published to ensure proper and uniform treatment of CDAD based on the severity of disease. The objective of this study is to evaluate compliance with the current recommendations for the treatment of Clostridium difficile infection at St. Marys Medical Center.

Methods
This is a single center, retrospective, electronic chart review of all hospitalized patients who had a positive Clostridium difficile toxin assay over the 16 month study period. Patient data collected will include date of positive toxin result, patient characteristics and laboratory values that indicate severity of illness, previous antibiotics (if documented), Clostridium difficile episode number, pertinent surgical procedures, treatment regimen and duration. An evaluation of each patients treatment will be used to assess adherence to the current recommendations.

Results
Results and conclusions are pending and will be presented at the 2010 Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Recognize important lab values for categorizing CDAD.

Outline proper treatment for patients with CDAD.

Self Assessment Questions:

True or False: The first step to treating a patient with CDAD is to stop the offending antibiotics when possible.

A 70 year old female patient is in the ICU with diarrhea and a positive C. difficile toxin test, without ileus, a temperature of 39.1C, albumin of 1.5mg/dl, and WBC count of 17,000. The most appropriate treatment would be:
A. Vancomycin 125mg PO Q6h
B. Metronidazole 500mg IV Q6h
C. Vancomycin 125mg PO Q6h plus Metronidazole 500mg IV Q6h

BLEEDING INCIDENCE AND RISK EVALUATION WITH CONCOMITANT USE OF ANTIDEPRESSANTS AND WARFARIN

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Purpose: Bleeding is the major complication associated with anticoagulant therapy with warfarin. The risk for bleeding is significantly increased when the international normalized ratio (INR) exceeds 4. Antidepressants that inhibit serotonin reuptake have also been associated with increased risk of bleeding and may further increase bleeding risk associated with anticoagulant therapy. As warfarin and antidepressants are used frequently in combination, evaluation of bleeding incidents and risk factors is warranted. The purpose of this retrospective, cohort study is to compare the incidence of bleeding between patients on concurrent warfarin and antidepressant therapy and those on warfarin therapy alone.

Methods: Following approval by the University of Illinois at Chicago (UIC) investigational review board, data on INR values and bleeding risk was collected. Patients were included if they were managed by the UIC Antithrombosis clinic on concomitant warfarin and antidepressant therapy for at least 6 months and a similar number of patients, matched for age, sex, and race, who are on warfarin therapy only. The incidence of bleeding and INR values exceeding 4 (a surrogate for increased bleeding risk) will be compared between those on or not on antidepressant therapy with warfarin. Bleeding events include minor and major bleeding such as patient reported bruising to frank bleeding.

Preliminary Results: 11 patients have been included to date, 3 prescribed an antidepressant along with warfarin and 8 on warfarin only. There were zero bleeding events in those on warfarin plus an antidepressant and 3 in those on warfarin only. Patients on warfarin plus antidepressants had an INR >4 an average of 7% of the time over a 6 month period vs. 2.7% in those on warfarin only. Data collection is ongoing.

Conclusions: We plan to collect data on a total of 220 patients, at which time data analysis will be completed and subsequent conclusions presented at Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Describe the potential mechanisms by which antidepressants can increase bleeding risk.

Identify patient specific factors which can increase bleeding risk.

Self Assessment Questions:

True/False. Selective serotonin reuptake inhibitors (SSRI) have varying levels of serotonin inhibition which can contribute to bleeding risk.

True/False. The results of this study demonstrate increased risk of major and minor bleeding in patients on concomitant warfarin and antidepressant therapy.

SELF-INSURED EMPLOYER GROUP PERSPECTIVES ON MEDICATION THERAPY MANAGEMENT SERVICES (MTMS)

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Purpose: Studies have shown that pharmacist-provided medication therapy management services (MTMS) improve health outcomes for employees resulting in reduced healthcare costs for employers. Many employers may be currently providing MTMS, but may not recognize the potential for a pharmacist to provide these services. The primary objective of this research is to determine self-insured employer group participation, current methods of delivery, and future interest in providing MTMS. Secondary objectives will 1) determine type of MTMS and methods of delivery desired; 2) identify potential barriers to providing MTMS and 3) identify the perceived importance of selected economic, clinical, and humanistic outcomes and process measures to self-insured employer groups.

Methods: An original survey will be developed and administered telephonically to a randomized sample of self-insured employer groups in Ohio that are currently registered with the Ohio Bureau of Workers Compensation. The survey will assess self-insured employer group current participation in MTMS, future interest in MTMS, barriers to providing MTMS, and perceived importance of outcomes from MTMS. IRB approval was obtained and data will be collected from January 2010-April 2010. Primary and secondary objectives will be analyzed using descriptive statistics.

Results: Data collection is in progress. Preliminary results will be presented.

Conclusions: Self-insured employer groups have the potential to benefit from participating in MTMS, but little is known about the current perception of MTMS in this population. Results of this study will assist in understanding self-insured employer group participation and future interest in MTMS. Insight into the perceived barriers and desired outcomes from MTMS will also be ascertained. This information will be useful when determining future marketing strategies for pharmacist-provided MTMS.

Learning Objectives:

Identify the most common medication therapy management services (MTMS) self-insured employer groups are currently providing to employees

Describe potential barriers that influence self-insured employer group participation in MTMS

Self Assessment Questions:

True or False: According to the survey, the most common MTMS currently provided by self-insured employer groups was comprehensive medication reviews

Multiple Choice: For employers that were currently providing MTMS, what potential barrier was the most influential when determining their interest in adding new services?
A.Limited budget to provide these services
B.Inadequate time to provide these services
C.Lack of interest in services from employees
D.Dont see value or importance of these services
E.Services are not offered by current healthcare provider

RETROSPECTIVE EVALUATION OF THE RELATIONSHIP BETWEEN VASOPRESSOR MAGNITUDE AND DURATION AND IN-HOSPITAL MORTALITY IN SEPTIC SHOCK: THE RESPONSE STUDY

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BACKGROUND:
International treatment guidelines for the management of septic shock recommend early-goal directed therapy (EGDT) with crystalloid or colloid resuscitation followed by administration of vasopressors to maintain adequate global and tissue perfusion. The relationship between vasopressor dosage or duration and mortality is unknown. Dosing recommendations for these agents are largely based on pharmacologic principles and dose vs. blood pressure response profiles, though adequate studies in patients with septic shock are lacking. Thus, vasopressor dosing recommendations, especially maximum doses, are vague and focused only on a surrogate for patient outcome.

METHODS:
This single-center, retrospective, observational study seeks to define the relationship between vasopressor requirements and in-hospital mortality in critically ill patients with septic shock. Adult patients with septic shock treated with vasopressors while in the medical intensive care unit or surgical intensive care unit at The University Hospital between January 2009 and March 2010 will be screened for inclusion into the study.

The primary objective is to evaluate the relationship between maximum and average daily corrected vasopressor index (VIC) and in-hospital mortality. VI is a dimensionless variable that quantifies a patients combined catecholamine exposure, defined as: VI = (dopamine dose x 1) + (epinephrine dose x 100) + (norepinephrine dose x 100) + (phenylephrine dose x 10). This value will then be corrected for the patients mean arterial pressure (MAP) as VIC = VI/MAP at any given time. Secondary objectives are to evaluate the relationship between in-hospital mortality and duration of maximum daily VIC; daily change in mean VIC and max VIC; and total duration of catecholamine use.

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

Learning Objectives:

Describe the epidemiology, pathophysiology, and recommended treatment of septic shock.

Discuss literature comparing the efficacy of vasopressor agents in septic shock as well as literature regarding vasopressor dosing in septic shock.

Self Assessment Questions:

Which of the following agents is recommended by the Surviving Sepsis Campaign as first-line treatment for septic shock?
A) Phenylephrine
B) Norepinephrine
C) Epinephrine
D) Dobutamine

True or False: Clear guidelines exist regarding target dosages of vasopressors for the treatment of septic shock.

IMPLEMENTATION OF A VASOPRESSOR ALGORITHM TO ENHANCE PRESCRIBING PRACTICE COMPLIANCE WITH THE INTERNATIONAL GUIDELINES IN SEPTIC SHOCK PATIENTS

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Purpose: Septic shock is defined as severe sepsis plus hypotension that does not resolve after aggressive fluid resuscitation. The Surviving Sepsis Campaign (SSC) provides guidelines for the choice of vasoactive therapies and recommends using norepinephrine or dopamine as first line vasopressors in hypotensive patients with septic shock. Factors that determine the specific vasopressor a patient should be prescribed include the hemodynamic profile and patients co-morbidities. The goal when dosing these agents is to use the minimum dose to be effective without causing adverse effects such as excessive peripheral vasoconstriction, hypoperfusion to organs, or worsening of other hemodynamic variables. Riverside Methodist Hospital currently has dosing and titration guidelines in place, but a treatment algorithm for choice of agents is needed. The primary objective of this study is to evaluate the compliance of an evidence based medicine vasopressor algorithm in the critical care unit. The impact of education on vasopressor selection, dosing regimens, and the use of vasopressin after initiation of the algorithm will be evaluated as a secondary objective.

Methodology: This is an observational study designed to look at the compliance of vasopressor selection and dosing based on the implementation of a vasopressor algorithm in the intensive care unit (ICU). A vasopressor algorithm for septic shock patients has been developed and will be implemented along with education to the health care team in the medical/surgical ICU. A retrospective review of vasopressor selection before the intervention and after the intervention will be done to determine if compliance with the algorithm has improved. The data will be used to determine adherence to the vasopressor algorithm.

Results/Conclusion: Data collection is ongoing. Results and conclusions of the research will be presented at the conference.

Learning Objectives:

Discuss the Surviving Sepsis Campaign guidelines for the choice of vasopressor agents in hypotensive patients with septic shock.

Explain the impact of education for adherence to a vasopressor algorithm which includes vasopressor selection, dosing regimens, and the initiation of vasopressin in the intensive care unit.

Self Assessment Questions:

T or F: Phenylephrine or Norepinephrine are recommended as first line agents in hypotensive patients with septic shock.

T or F: Many septic shock patients have been shown to have a vasopressin deficiency.

IMPROVEMENT OF INPATIENT ANTICOAGULATION MANAGEMENT IN A COMMUNITY HOSPITAL

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Background: Anticoagulants are targeted by the Joint Commission and Lean Six Sigma as high-alert medications. Appropriate use results in increased quality of care and reduction of patient harm. The purpose of this study is to improve anticoagulation prescribing and management at St. Margaret Mercy (SMM), a two-campus hospital in Northwest Indiana.

Methods: Baseline data was collected for patients anticoagulated for treatment of deep vein thrombosis (DVT), pulmonary embolism, atrial fibrillation, cardiomyopathy, and acute coronary syndrome. Randomized, retrospective medication use evaluations were performed on adult, non-pregnant patients who received treatment doses for 48 hours or more during one admission from January to June 2009. Primary outcomes included appropriate use and incidence of adverse reactions. Secondary endpoints included assessment of bridge therapy with warfarin.

Results: Primary use of enoxaparin (n=100), unfractionated heparin (n=25), and fondaparinux (n=14) was assessed. The most common indications were DVT (39.63%) and atrial fibrillation (21.95%). The average duration of treatment was 7 days (range 1 to 26 days). Treatment was appropriate in 69.34% of patients. The most frequent reasons for inappropriate anticoagulation (n=51) were incorrect drug or dose (8.33% each). Adverse events, seen in 20.44% of subjects, included thrombocytopenia (46.15%) and bleed (3.85%). Seven patients required treatment for a new DVT as a result of inappropriate prophylaxis after admission for another diagnosis. Warfarin was not initiated in 7.76% of indicated patients, and was started after 3 days in 35.29% of cases.

Conclusion: One-third of cases involved inappropriate anticoagulation, indicating the need for increased pharmacy involvement. Due to the incidence of DVTs secondary to inadequate prophylaxis, the study will next focus on improving DVT prophylaxis rates through individualized pharmacy-based recommendations. Additional education will be provided to pharmacy, medical and nursing staff to improve anticoagulation therapy. A heparin induced thrombocytopenia protocol will be developed to optimize screening and management.

Learning Objectives:

Identify appropriate indications, doses and regimens for unfractionated heparin, enoxaparin and fondaparinux.

Identify areas for optimization of anticoagulation treatment and prophylaxis.

Self Assessment Questions:

Which of the following is a "never event" according to CMS guidelines?
a.Heparin induced thrombocytopenia
b.Major bleed
c.VTE after inappropriate prophylaxis
d.All of the above

T/F In patients requiring long-term anticoagulation, the initiation of warfarin is recommended within 7 days of starting a parenteral anticoagulant.

IMPLEMENTATION OF A PHARMACY INFORMATION SYSTEM AS PART OF AN INTEGRATED ELECTRONIC MEDICAL RECORD

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Background: The American Recovery and Reinvestment Act became law in February 2009 providing $17.2 billion in Medicare and Medicaid incentive payments to doctors and hospitals for "meaningful use" of electronic medical records (EMR) systems starting in 2011. The Ohio State University Medical Center (OSUMC) implemented a new pharmacy information system in December 2009. This pharmacy application is one module of an acute care EMR. Physician ordering and nurse documentation modules of this EMR are scheduled for implementation in 2011. The new pharmacy system will initially be configured similar to the legacy pharmacy system used at OSUMC. The legacy application was designed with pharmacy services paramount, whereas the new application is one part of an EMR that includes functionality spanning all hospital departments and disciplines. The advantage to the new application is that it will one day be part of the integrated EMR and pharmacists will have real time information about the patients that is shared among all members of the health care team.

Purpose: The purpose of this study is to evaluate how implementation of a pharmacy system that is part of an integrated EMR affects pharmacy staff and operations.

Methods: To evaluate the new pharmacy applications ability to mimic the legacy application, the following information will be gathered and analyzed pre- and post-implementation of the new pharmacy application: order entry turn-around time (TAT) and pharmacy staff satisfaction. TAT will be assessed through tracking the time it takes the pharmacist to enter an order for a set of medications. A satisfaction survey will be distributed electronically to pharmacy staff. Results of all data collected will be used to understand what compromises, if any, pharmacy staff has made to convert to the new pharmacy application.

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

Learning Objectives:

Assess the advantages and disadvantages of a pharmacy system that is part of an EMR

Discuss compromises pharmacy staff has made in conversion to the new pharmacy application

Self Assessment Questions:

1.List an advantage to having an EMR

2.When did the American Recovery and Reinvestment Act become law?

THE CORRELATION BETWEEN MEDICATION ADHERENCE AND DISEASE ACTIVITY IN ADULT PATIENTS WITH RHEUMATOID ARTHRITIS RECEIVING CARE AT A SPECIALTY PHARMACY

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PURPOSE: Medication nonadherence is a significant problem in the effective management of chronic diseases. In rheumatoid arthritis (RA), it can lead to elevated levels of disease activity and functional impairment. The purpose of this study is to determine the correlation between the adherence to biologic therapy and disease activity in adult patients diagnosed with RA receiving care from a community-based specialty pharmacy.

METHODS: Patients receiving biologic therapy from Diplomat Specialty Pharmacy are enrolled into an RA drug therapy management (DTM) program, which includes disease-specific education, medication-use training, and monitoring with the goal of optimizing medication adherence. Patients are also routinely surveyed to assess self-reported disability using measures such as the Modified Health Assessment Questionnaire (HAQ-II) and numerical rating scales (NRS) for pain and fatigue. Increased adherence as a result of these additional interventions may lead to improvements in disease activity and reduced functional impairment. This study retrospectively evaluates the correlation between medication adherence and patients self-reported disability. Adherence is defined as the patients medication possession ratio (MPR), which is calculated using prescription refill data. HAQ-II scores and NRS scores for pain and fatigue are collected as measures of the patients self-reported disability and are obtained prior to initiating biologic therapy and at six-month intervals. The correlation between medication adherence and these measures of disability will be determined at six and twelve months following the start of therapy. Patients eligible for evaluation include those over the age of eighteen receiving FDA-approved doses of etanercept or adalimumab for the treatment of RA for at least twelve months at this pharmacy.

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

Learning Objectives:

Identify factors that can affect medication adherence in patients being treating for RA.

Outline pharmacy-based interventions that can be used in the evaluation and improvement of patient-centered outcomes in RA patients.

Self Assessment Questions:

All of the following can affect medication adherence in patients being treated for RA, except:
a.Medication cost
b.Disease duration
c.Perceived and actual medication side effects
d.Understanding the necessity of medication
e.All of the above can affect medication adherence

Delivery of patient-centered education by the pharmacist to patients being treated for chronic diseases has been shown to:
a.Improve adherence
b.Clarify benefit versus risk beliefs
c.Reduce medication-related problems
d.A and C
e.All of the above

EFFECT OF TENOFOVIR ON GLOMERULAR FILTRATION RATE AMONG HIV-INFECTED VETERANS

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This retrospective study will evaluate the effect of tenofovir therapy on serum creatinine and estimated glomerular filtration rate (GFR) in the HIV-positive veteran population within Veterans Integrated Service Network (VISN) 10 in comparison with HIV-positive patients not treated with tenofovir. In addition, this study will also evaluate the effect of concomitant disease and medications as well as the occurrence of acute hospitalizations for nephropathy during the study period.
The Veterans Affairs Computerized Patient Record System (CPRS) as well as the clinical case registry (CCR) will be used to identify patients with a diagnosis of HIV that were treated with a tenofovir based regimen as a part of highly active antiretroviral therapy (HAART) at the outpatient clinics in VISN 10 between January 2002 and December 2008. A second search will then be conducted to identify patients with baseline measurements including serum creatinine, and estimated GFR, [calculated by the Modification of Diet in Renal Disease (MDRD) equation], of at least 60 ml/min during one year prior to tenofovir initiation as well as at start of therapy. Of those identified, patients with history of episode(s) of acute renal failure and those with chronic kidney disease prior to tenofovir use will be excluded. Other exclusion criteria are concomitant Hepatitis B or C treatment, and patients with less than ten repeated serum creatinine measurements during the study period. A similar computerized search will be conducted to identify HIV-positive patients on a regimen not containing tenofovir. Changes in estimated GFR and serum creatinine will then be identified over a 5 year treatment period, and patients will be divided into treatment groups based on change in creatinine and subsequent change in therapy.
Final approval has yet to be obtained, and therefore initial results are not available at the time of submission.

Learning Objectives:

To describe the proposed factors that contribute to tenofovir toxicity and monitoring parameters recommended with therapy.

To discuss the results and implications on prescribing patterns at the Cincinnati VAMC outpatient HIV clinic.

Self Assessment Questions:

What factors have been found to be associated with increased risk of tenofovir toxicity?

Increased serum concentrations of tenofovir, and possible increased toxicity, occur when administered concomitantly with what protease inhibitor?

EVALUATION OF HIGHLY ACTIVE ANTIRETROVIRAL THERAPY IN PATIENTS RECEIVING CHEMOTHERAPY FOR HIV-RELATED MALIGNANCY

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Purpose:
Chemotherapeutic treatment for human immunodeficiency virus (HIV)-related malignancy has been a significant area of research in recent years. Studies have explored dose-reduced, standard, and dose-intensive chemotherapy. While much has been published regarding optimal chemotherapy to treat HIV-related malignancy, minimal clinical research is available to guide the selection of highly active antiretroviral therapy (HAART) in this population. Several in vitro studies have suggested risks and benefits specific to protease inhibitors or non-nucleoside reverse transcriptase inhibitors, including induction/inhibition of apoptosis and interference with drug resistance mechanisms. Additionally, many HAART medications are metabolized by the same cytochrome P450 enzymes responsible for chemotherapy metabolism, allowing the possibility of drug-drug interactions. Currently, there are no clinical trials to suggest which HAART combination is desirable for this population during chemotherapy treatment. The purpose of this study is to evaluate drug toxicities related to specific combinations of chemotherapeutic and antiretroviral medication.

Methods:
An IRB approved, retrospective review of patients being treated for HIV-related malignancy between January 1, 1996 and December 31, 2009 is being conducted. Eligible patients are age 18 to 89 years of age, diagnosed with HIV, and have received chemotherapy and HAART medication concurrently for treatment of HIV-related malignancy. Data to be collected include demographics, HAART medication, chemotherapy regimen, pertinent lab values, occurrence of opportunistic infection, and drug toxicities. A FileMaker Pro database will assist with complex queries to detect toxicities related to combinations of chemotherapy and HAART medication. The primary outcome is determination of medication combinations causing drug related toxicity, as graded by version 4.0 for Common Terminology for Adverse Events. Secondary outcomes will assess delays in chemotherapy and the development of opportunistic infections.

Results/Conclusions:
Data collection is currently in progress. Results and conclusion will be presented at the conference.

Learning Objectives:

Review the HIV-related malignancies and their most common chemotherapeutic treatment regimens.

Identify the potential pharmacokinetic and pharmacodynamic interactions between chemotherapy agents and HAART.

Self Assessment Questions:

HAART therapy is the combination of at least 3 antiretroviral medications, including either 1 protease inhibitor (PI) or 1 non-nucleoside reverse-transcriptase inhibitor (NNRTI) given in combination with a nucleoside reverse-transcriptase inhibitor (NRTI) backbone. T/F

Protease inhibitors may interfere with drug resistance mechanisms. T/F

VALIDATION OF INSTITUTIONAL VANCOMYCIN DOSING RECOMMENDATIONS IN PEDIATRIC AND NEONATAL PATIENTS

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Purpose Statement:
Recent guidelines suggest targeting higher vancomycin serum trough concentrations to optimize patient outcomes. This study sought to compare vancomycin trough concentrations among pediatric and neonatal patients who received vancomycin across three total daily dose ranges.

Methods:
Pediatric and neonatal patients who received vancomycin and had at least one serum trough level obtained were retrospectively identified. Patients with cystic fibrosis, renal dysfunction, and burn patients were excluded. Pediatric and neonatal patients were evaluated in separate arms of the study. Patients in each arm were stratified across three different dosing regimens, 25-50 mg/kg/day(low), 51-70mg/kg/day(medium), or 71-100mg/kg/day(high) in the pediatric arm, and <20 mg/kg/day(low), 20-40mg/kg/day(medium), and >40mg/kg/day(high) in the neonatal arm. The percentage of patients with trough levels within the desired range of 10-20 mcg/mL and the mean absolute trough were compared across the three groups.

Preliminary Results: To date, 65 patients have been evaluated [pediatric arm, n=19(low), n=23(medium), n=7(high); neonatal arm, n=7(low), n=2(medium), n=7(high)]. The median age was 3(0.02-18) years in the pediatric arm and 41.5(3-240) days in the neonatal arm. In the pediatric arm, the median trough level was 6.9(1-18.3), 11.7(5.1-32.1), and 11.3(4.9-35.7) mcg/mL in the low, medium, and high dosing groups, respectively (p=0.011). The percentage of patients within goal trough range was 21.1%, 43.5%, and 28.6% in the low, medium, and high dosing groups, respectively(p=0.295). In the neonatal arm, the median trough levels were 3.9 (1-13.7), 13.9(7.3-20.5), and 16.7(5.8-26.5) mcg/mL in the low, moderate, and high dosing groups, respectively(p=0.014). The percentage of neonatal patients at goal were 14.3%, 0%, and 42.9%, in the low, medium, and high dosing groups, respectively (p=0.319).

Conclusions:
Based on preliminary results, low doses vancomycin are not adequate to achieve a therapeutic trough level. Clinicians must consider more aggressive dosing to achieve vancomycin trough levels within the goal range of 10-20 mcg/mL.

Learning Objectives:

Describe pharmacokinetic and pharmacodynamic monitoring parameters used to predict clinical effectiveness of vancomycin

Identify the goal serum vancomycin concentrations in a pediatric/neonatal patient for a given indication

Self Assessment Questions:

True/False: The Cockcroft/Gault equation is an appropriate assessment of renal function in pediatric and neonatal patients.

True/False: While major pediatric reference recommend empiric therapy at 40 mg/kg/day for non-closed space infections, a recent study in pediatric patients demonstrated that doses of 40 mg/kg/day never reached target AUC/MIC ratio for MRSA infections unless the MIC was ≤0.5 mcg/mL.

DEXMEDETOMIDINE FOR PROCEDURAL SEDATION DURING DRESSING CHANGES FOR BURN PATIENTS

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Purpose:
The purpose of the study is to evaluate the efficacy of dexmedetomidine for use as a sedative agent for use during burn dressing changes.

Methods:
A prospective evaluation of a new protocol detailing the use of dexmedetomidine in adult (>18 years) burn patients requiring procedural sedation for dressing changes will be conducted from November 2009-April 2010. The study is IRB approved. Patients will be included if they are >18 years old and require procedural sedation for burn dressing changes. Patients will be excluded if they are intubated or have hypotension or bradycardia at baseline. Dexmedetomidine will be given as a 1 mcg/kg bolus over 10 minutes; followed by a continuous infusion starting at 0.5 mcg/kg/hr. The infusion can be titrated every 5 minutes by 0.2mcg/kg/hr as needed to achieve a target Riker sedation score of 2 or a RASS of -4. Analgesia with fentanyl or morphine will be administered to all patients. All medication given to the patient during the dressing change will be noted. Vitals will be monitored every 5 minutes and the infusion will be stopped if the heart rate or blood pressure goes outside the protocol defined limits. Nurses and physicians will subjectively evaluate their satisfaction with the quality of sedation dexmedetomidine provides.

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

Learning Objectives:

Identify the qualities of dexmedetomidine that make it an ideal agent for procedural sedation during burn dressing changes.

Describe the dosing strategy used for procedural sedation during burn dressing changes.

Self Assessment Questions:

What are the two main side effects of dexmedetomidine?

True or False: Dexmedetomidine is FDA approved for procedural sedation.

INITIAL VANCOMYCIN DOSING IN NEONATAL AND PEDIATRIC PATIENTS

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Introduction
Methicillin-resistant Staphylococcus aureus (MRSA) infections have been increasing in neonatal and pediatric patients requiring more frequent vancomycin use. Serum trough levels are used to assess efficacy for vancomycin due to time dependent pharmacokinetic parameters. Low initial trough levels have been associated with therapeutic failures and the emergence of resistance. Literature recommends starting vancomycin dosing for infants and pediatric patients in a range of 40-60 mg/kg/day, but studies have shown that patients often fail to reach therapeutic levels with these doses. In September 2008, empiric vancomycin doses were increased at our organization for neonatal and pediatric patients. The purpose of this study is to determine if the target serum vancomycin concentrations are being obtained with the current dosing recommendations at our institution.

Methods
This study is a retrospective chart review of all patients less than 18 years old receiving vancomycin therapy between October 2008 and March 2009 at our institution. Data collected will include patient demographics, vancomycin dose and schedule, infectious disease indication, concomitant nephrotoxic drugs, blood urea nitrogen, serum creatinine, and vancomycin serum trough concentrations. Compliance with the dosing guidelines will be reviewed and logistic regression will be employed to identify the factors which may effect the obtainment of therapeutic vancomycin levels.

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

Learning Objectives:

Recognize at least two complications of low initial vancomycin trough levels

Discuss the role of therapeutic drug monitoring for the efficacy of vancomycin

Self Assessment Questions:

True/False: Therapeutic failures and the emergence of resistance have been associated with low initial vancomycin concentrations.

How does therapeutic drug monitoring impact vancomycin therapy?

EVALUATION OF MEAN ARTERIAL PRESSURE GOAL ATTAINMENT WHEN USING MONOTHERAPY VASOPRESSIN AS COMPARED TO NOREPINEPHRINE IN THE MANAGEMENT OF SEPTIC SHOCK

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Purpose: The Surviving Sepsis Campaign (SSC) guidelines recommend norepinephrine or dopamine as the initial vasoactive agent to target a mean arterial pressure (MAP) greater than or equal to 65 mm Hg. The administration of vasopressin is recommended as adjunctive treatment for the management of septic shock while the role of vasopressin as monotherapy remains undefined for this indication. The primary objective of this study was to determine if monotherapy vasopressin is non-inferior to norepinephrine in the achievement of a MAP greater than or equal to 65 mm Hg within the first 6 hours of septic shock onset. Secondary objectives included the impact of drug therapy on sepsis-related variables including: requirement for renal replacement therapy, intensive care unit (ICU) all-cause mortality, ICU length of stay, and the time course of shock defined as time until goal MAP attainment or need for additional treatment.

Methods: This retrospective cohort review included 130 adult patients, 65 in each group, admitted to the University of Chicago Medical Center for the treatment of septic shock. Study patients were identified using ICD-9 codes from hospital disease, procedure, and medication databases. Patients treated with initial vasopression or norepinephrine monotherapy for treatment of septic shock were evaluated for study inclusion. Patients were excluded if initiated on concurrent vasoactive agents, or admitted to a cardiology or cardiothoracic surgery service. APACHE II scores were used as a marker of illness severity for patient matching between treatment groups. Primary endpoint of goal MAP attainment within 6 hours was used to determine sample size needed to detect a 25% difference with an 80% power and an a prior alpha = 0.05. Confounding variables, including intravascular volume status and usage of corticosteroids or activated protein C was evaluated.

Results: To be presented

Conclusions: To be presented

Learning Objectives:

Evaluate the potential role of vasopressin within early goal directed therapy when managing patients with septic shock

Analyze the unique physiologic mechanisms that distinguishes vasopressin from other vasoactive agents

Self Assessment Questions:

Vasopressin is an endogenous hormone associated with:
A. Sodium and water retention
B. Smooth muscle constriction
C. Tissue specific modulation of nitric oxide
D. Transformation of ATP-sensitive potassium channels in refractory septic shock
E. All of the above

Which of the following is false?
A. According to the SSC guidelines, vasopressin is recommended as an adjunctive therapy to norepinephrine or dopamine when targeting MAP
B. The recent VAST trial suggests vasopressin has a potential mortality benefit in a subset of patients with less severe septic shock when used as adjuvant to norepinephrine
C. Vasopressin for the management of septic shock is typically infused as a fixed dose
D. Vasopressin administration to a hemodynamically stable individual will significantly increase the MAP
E. All of the above are true

UTILITY OF CLINICAL AND LABORATORY DATA IN THE IDENTIFICATION OF HEPARIN-INDUCED THROMBOCYTOPENIA (HIT)

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Purpose:
In the presence of heparin or low-molecular weight heparin (LMWH), thrombocytopenia, often defined as a decrease in platelets by ≥ 50%, prompts laboratory testing for heparin-induced thrombocytopenia (HIT) antibodies for a confirmatory diagnosis of HIT. However, the most readily available assay is sensitive for heparin antibodies but not specific for HIT and more in depth clinical evaluation may still be necessary for confirmation of diagnosis. The goal of this study is to identify the clinical utility of a commercially available serologic laboratory test in diagnosis of HIT.

Methods:
Previous retrospective analysis of electronic medical data from hospitalized patients during a 17-month period ending June 2007 identified all patients with a ≥ 50% drop in platelets and/or a HIT antibody test and also an order for heparin or LMWH. Manual chart review will be used to identify those patients with other likely causes of thrombocytopenia (i.e. medication, concomitant disease states). Of remaining patients determined to be at risk for HIT, a search will be performed to identify subsequent care, including time from significant decrease in platelets to discontinuation of heparin product, initiation of alternative anticoagulation, medications at discharge. Medical records will also be searched for addition of heparin as a patient allergy or intolerance. Resulting venous or arterial thromboembolism and/or HIT syndrome at or following detection of likely HIT will also be recorded and presented.

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

Learning Objectives:

List at least two clinical factors indicative of a heparin induced thrombocytopenia (HIT) diagnosis.

Recognize barriers in the diagnosis of HIT

Self Assessment Questions:

Which of the following factors should be considered in the clinical diagnosis of heparin induced thrombocytopenia (HIT)?
a)Percent change in platelet count from baseline
b)Presence of a new arterial or venous thrombus
c)Time to onset of fall in platelets
d)All of the above

(T/F) Diagnosis of HIT requires clinical and laboratory data.

EVALUATION OF A COMMUNITY BASED PHARMACIST MEDIATED INTERVENTION FOR PATIENTS WITH DIABETES

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Background: Diabetes is a common chronic condition that affects millions of Americans and is increasing at an alarming rate. The prevalence of diabetes is higher among patients in low-income communities. Studies have shown that patients with diabetes have higher morbidity and mortality rates, but studies have also shown that these rates can be lowered with pharmacist-managed programs. There are several evidence-based clinical recommendations to help achieve successful diabetes management, but access to these interventions is difficult for low-income patients. In order to provide successful management, patients need adequate education and community support. Pharmacist interventions for patients with diabetes living in low-income communities are needed to improve care.

Objective: Are clinical and social outcomes improved for patients enrolled in a community-based pharmacy-led diabetes management program?

Methods: This non-randomized, prospective study was designed to assess the effectiveness of interventions by a pharmacist in a community setting. Participants were adult patients chosen from low-income pharmacy care programs that were taking anti-hyperglycemic medications. Patients who were pregnant, had a clinically diagnosed mental illness, or cardiovascular event within the last 3 years prior to the study were excluded. Participants met with a pharmacist for diabetes education and management monthly during the months of November 2009 to March 2010 to facilitate care. The primary outcome of this study was the change in Hemoglobin A1c from baseline. Secondary outcomes included blood pressure, lipids, willingness to participate in physical activity, quality-of-life, self-reported adherence, and patient satisfaction with overall health.

Results and Conclusion: Data collection and analysis are ongoing. Final results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference in April 2010.

Learning Objectives:

Define the role of a community pharmacist in the management of patients with diabetes.

Describe the American Diabetes Associations National Standards for Diabetes Self-Management Education.

Self Assessment Questions:

True or False? According the American Diabetes Association Guidelines lowering A1C to below or around 7% has been shown to reduce microvascular and neuropathic complications of Type 1 and Type 2 diabetes.

True or False? According the American Association of Clinical Endocrinologists, dual therapy should be initiated for A1C of 6-7%

CORRELATION OF ENOXAPARIN DOSE AND PEAK ANTI-FACTOR XA LEVEL IN OBESE PATIENTS

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Purpose

Enoxaparin is a low-molecular-weight heparin (LMWH) that is often the antithrombotic of choice for the prevention and treatment of venous thromboembolism. The effect of an enoxaparin dose can be monitored by measuring the peak plasma level of anti-factor Xa, which correlates with the antithrombotic effect, as well as with the risk of excessive bleeding. Dosing with LMWHs is well characterized for normal weight patients, and does not typically require anti-factor Xa monitoring. However, the appropriate dosing of LMWHs in obese patients is a controversial issue. The American College of Chest Physicians Evidence-Based Clinical Practice Guidelines on parenteral anticoagulants recommends weight-based dosing in obese patients receiving either LMWH prophylaxis or treatment. Currently, therapeutic dosages of enoxaparin are individualized based on total body weight, but prophylaxis doses are generally fixed and not adjusted based on weight. The primary objective of this study is to evaluate if a correlation exists between enoxaparin dose and peak anti-factor Xa level in obese patients to determine if they are receiving the appropriate dose for either prophylaxis or treatment.

Methods

This study was approved by the Institutional Review Board prior to commencement. Patient eligibility is determined by a predefined set of inclusion and exclusion criteria. The three dosing regimens which are being evaluated include prophylaxis dosing of either 40 mg daily or 0.5 mg/kg daily, and therapeutic dosing of 1 mg/kg twice daily. Peak anti-factor Xa levels are obtained through venipuncture four hours after the third dose in prophylactic regimens, and four hours after the fourth dose in therapeutic regimens. The desired peak anti-factor Xa level is 0.1-0.4 units/mL for prophylaxis dosing, and 0.5-1 units/mL for therapeutic dosing.

Results/Conclusion

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

Learning Objectives:

Describe the different dosing strategies for enoxaparin based on current literature.

Discuss if a correlation exists between enoxaparin dose and peak anti-factor Xa level in obese patients.

Self Assessment Questions:

True/False: Obese patients are at an increased risk of developing a venous thromboembolism.

True/False: At this time, it can be concluded that weight-based prophylaxis dosing with enoxaparin is superior to a fixed dose in obese patients.

EVALUATION OF A STANDARDIZED WARFARIN DOSING PROTOCOL COMPARED TO CURRENT PRACTICE

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Purpose
To determine if a standardized warfarin dosing protocol is as effective in reducing time outside of therapeutic international normalized ratio (INR) range compared to current practice in hospitalized internal medicine patients.

Methods
Phase I is a retrospective chart review of 50 patients who received warfarin from January 2009 to September 2009. Phase II is a prospective analysis of 50 warfarin managed patients based on the study dosing protocol beginning in January 2010. Subjects were included if they were at least 18 years of age, warfarin-nave, or warfarin-experienced. Subjects were excluded if their baseline INR was greater than 1.3 without being on warfarin prior to admission or those who required bridge therapy with Argatroban. Therapeutic INR range was defined as any value within 2 to 3.5 depending on the patients indication for warfarin anticoagulation. The primary outcome was to reduce time outside of therapeutic INR range, secondary outcomes included time to therapeutic INR, percentage of non-therapeutic INR values, INR at discharge, any documented hemorrhagic event, documented thromboembolic event, number of patients who received vitamin k, blood transfusion(s), or fresh frozen plasma.

Phase I Results
After initiation of warfarin, mean time spent outside of therapeutic INR range was 4.3 days while mean time to therapeutic INR was 2 days. Based on the proportion of non-therapeutic INR values to the total number of INR values obtained, 77% were considered in the non-therapeutic range. The mean INR value at discharge was 2 and 17 patients were discharged before reaching therapeutic INR. A major hemorrhagic event occurred in four patients while minor hemorrhagic event occurred in three patients. One patient experienced a massive pulmonary embolism which lead to death after initiation of warfarin.

Conclusion
Phase II results will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Describe the pharmacokinetics of warfarins therapeutic effects

Recognize the risk factors for increased warfarin sensitivity in hospitalized patients

Self Assessment Questions:

Which of the following can falsely elevate INR values?
a.Atorvastatin
b.Argatroban
c.Lisinopril
d.Furosemide

2.Which of the following increases the risk for supratherapeutic INR with concomitant administration of warfarin?
a.Heavy smokers
b.Rifampin
c.Glucocorticoids
d.Fluoroquinolones

EVALUATION OF A COMPUTER-BASED INTERVENTION TO ENHANCE METABOLIC MONITORING IN PSYCHIATRY INPATIENTS TREATED WITH SECOND-GENERATION ANTIPSYCHOTICS

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On December 3, 2008 a new electronic pop-up alert specific to the adult psychiatry service of the University of Michigan Hospital UM-CareLink computerized physician order entry (CPOE) system was implemented to encourage clinicians ordering second generation antipsychotics (SGAs) to order fasting lipid and glucose levels for metabolic monitoring purposes. The alert also facilitates the ordering of appropriate labs by allowing clinicians to request labs directly via the pop-up window. In this study we evaluate the effect of this alert on the rates of monitoring metabolic laboratory parameters for adult psychiatry inpatients treated with SGAs.

A single-center, retrospective chart review will be performed in which patient demographics as well as SGA drug and laboratory order data will be extracted from the UM-CareLink CPOE database for patients admitted to the University of Michigan Hospital adult psychiatric unit between June 2, 2008 and June 3, 2009. The number of patients on SGA therapy admitted between June 2, 2008 and December 2, 2008 for which fasting blood glucose levels and fasting coronary heart disease (CHD) panels are available will be compared to those patients admitted between December 3, 2008 and June 3, 2009 in order to assess the impact of the new alert on the collection of appropriate metabolic monitoring data. Patient inclusion criteria will include all adult (18 years or older) psychiatric inpatients admitted to the 9C hospital unit receiving SGA therapy during the study period. Exclusion criteria will include patients younger than 18, readmissions within the study period, and patients receiving SGAs only on an as needed (prn) basis. Data will be de-identified during the extraction process to protect patient privacy. This project is currently pending Institutional Review Board approval.

Results of this study are pending completion of data collection and analysis.

Learning Objectives:

Recognize the importance of monitoring metabolic parameters in patients treated with second-generation antipsychotics.

Identify possible barriers to appropriate metabolic monitoring in psychiatry inpatients treated with second-generation antipsychotics.

Self Assessment Questions:

Which of the following metabolic side effects have been associated with second-generation antipsychotic use?
a.Weight gain
b.Glucose intolerance/Type 2 Diabetes
c.Hyperlipidemia
d.All of the above

All of the following are possible barriers to appropriate metabolic monitoring in psychiatry inpatients treated with second-generation antipsychotics EXCEPT:
a.A lack of continuum of care between multiple health care providers
b.Established institutional guidelines or protocols
c.Insufficient resources
d.Psychiatric conditions impairing patient follow-up, leading to missed appointments and/or withdrawal from care

PAIN MANAGEMENT FOLLOWING TOTAL KNEE ARTHROPLASTY: SCHEDULED VERSUS "AS-NEEDED" PHARMACOTHERAPY

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Purpose: The purpose of this study is to examine different pain regimens after total knee arthroplasty (TKA) to determine if a scheduled pain regimen that does not include epidurals, patient controlled analgesia (PCA), and other intravenous (IV) opiates differs from one that includes such methods in its ability to provide adequate pain control. Specifically, this retrospective study will compare the impact in patients undergoing TKA of a medication regimen consisting of scheduled medications to one which utilizes as-needed medications on several clinically important measures related to successful pain control.

Methods: This is a single-center, retrospective chart review evaluating pain management following a total knee arthroplasty (TKA) at Saint Marys Health Care. Eligible patients (n=238) were those meeting the following inclusion criteria: greater than or equal to 18 years of age and total knee arthroplasty between April 1st, 2009 and October 31st, 2009. Statistical analysis of pain scores between groups will use the Wilcox rank sum test. Secondary objectives (the amount of pain medication used; the amount of muscle relaxant used; use of anti-nausea medications; and the length of stay between the two groups) will be analyzed using t-tests (unpaired). Scheduled versus as needed anti-nausea medication use will be analyzed using the chi-squared test.

Results: Data collection ongoing at abstract deadline.

Conclusions: To be presented pending data review and analysis.

Learning Objectives:

To explain commonly used medications and practices for pain control after total knee arthroplasty

To identify possible differences between pain management regimens for use after total knee arthroplasty

Self Assessment Questions:

TRUE/FALSE Every surgeon uses the exact same pain regimen following total knee arthroplasty

TRUE/FALSE There are numerous other factors to consider such as physical therapy that could influence a patients recovery and pain scores

EVALUATION OF DEXMEDETOMIDINE BASED TREATMENT VERSUS STANDARD TREATMENT IN ALCOHOL WITHDRAWAL IN A HOSPITAL SETTING

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Purpose: Currently in the United States treatment of choice for alcohol withdrawal is benzodiazepine therapy, most commonly lorazepam and diazepam. These medications are traditionally dispensed according to the symptom based Clinical Institute Withdrawal Assessment (CIWA) scale. The purpose of this study is to assess the benefits, risks, and cost of using dexmedetomidine versus standard benzodiazepine treatment in patients experiencing alcohol withdrawal.

Methods: This is a retrospective medical chart review. Patients diagnosed with alcohol withdrawal will be divided into two groups: dexmedetomidine based treatment or CIWA protocol lorazepam based treatment. The primary outcomes analyzed will be vital signs (blood pressure, heart rate, respiratory rate), incidence of seizures, endotracheal intubation and death. Secondary outcomes include duration of hospital stay and withdrawal treatment cost. Patients will be included in this study if they meet the following criteria: at least 18 years of age, diagnosis of alcohol withdrawal and/or delirium tremens, and received dexmedetomidine treatment or lorazepam based CIWA treatment. Exclusion criteria will include patients receiving benzodiazepine therapy for purposes other than alcohol withdrawal (e.g. sedation), patients with known or suspected adverse reactions to benzodiazepines, dexmedetomidine, or clonidine, and pregnant females or females suspected of being pregnant.

Results: Data analysis is currently in progress. Final results will be presented at the Great Lakes Pharmacy Resident Conference meeting.

Learning Objectives:

Describe the risks and benefits of using dexmedetomidine to treat patients experiencing alcohol withdrawal.

Explain the role of dexmedetomidine in the treatment of alcohol withdrawal.

Self Assessment Questions:

What is the mechanism of action of dexmedetomidine?
a.Alpha 2 antagonist
b.Beta 2 agonist
c.Acetylcholinesterase inhibitor
d.Alpha 2 agonist
e.Serotonin reuptake inhibitor

True/False: It is more cost effective to treat alcohol withdrawal using dexmedetomidine than benzodiazepine therapy.

IMPLEMENTATION AND EVALUATION OF INTENSIVE PHARMACIST MONITORING OF WEIGHT-BASED HEPARIN PROTOCOLS IN A VA MEDICAL CENTER

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Purpose: In current literature, pharmacist involvement in managing anticoagulation has been analyzed and showed consistent evidence of improved clinical outcomes. The objective of this study is to assess current heparin monitoring practices at the Milwaukee VA and develop a new pharmacist monitoring program which will allow timely and accurate intervention by pharmacists based on the medical center's weight-based heparin protocols.

Methods: Prior to commencement, the study was submitted to the Institutional Review Board for approval. The health systems electronic medical record system was used to identify any male or female ≥ 18 years old being treated with one of three weight-based heparin protocols for greater than 24 hours. The primary outcome is to measure the percent of timely and accurately adjusted heparin infusion rates ["timely" which is defined as within 1 hr from partial thromboplastin time (PTT) results are posted]. Secondary outcomes include: PTT ordered in a timely fashion (q6hr +/- 1 hr), PTT collected and posted results in a timely fashion (+/- 1hr), platelet count ordered daily, bleeding events and medication errors. A retrospective review was conducted to retrieve patients who were on a weight-based heparin protocol and collected PTT, platelet count, lab collection, heparin rates, adverse reactions, medication errors and appropriate documentation by nursing staff. After analysis of retrospective data, a pharmacist monitoring program will be developed and implemented. The same primary and secondary outcomes will be analyzed post-implementation.

Results/Conclusions: To date, retrospective data has been collected for 40 qualifying patients. Preliminary results show that 79.3% of infusions were adjusted timely and 88.5% of infusions were accurate. This information suggests that the Milwaukee VA may benefit from the development of intensive pharmacist monitoring of heparin infusion practices.

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

Learning Objectives:

Describe the importance of pharmacist involvement in managing anticoagulation to help improve clinical outcomes.

Identify criteria for major and minor bleeding events.

Self Assessment Questions:

True/False: Evidence has shown that physician management of anticoagulation has improved clinical outcomes.

All of the following are criteria for a major bleeding event EXCEPT:

a. decrease in hemoglobin of more than 2g/dL
b. epistaxis
c. intracranial hemorrhage
d. transfusion of 2 units or more of packed red blood cells
e. hemarthrosis

RISK FACTORS FOR BK POLYOMAVIRUS FOLLOWING KIDNEY, SIMULTANEOUS KIDNEY-PANCREAS, OR PANCREAS AFTER KIDNEY TRANSPLANTATION

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Purpose: BK virus has become one of the leading pathogens implicated in graft loss and dysfunction following kidney transplant. Prior to developing BK nephropathy, patients experience activation of BK virus, which can be detected through various screening methods such as urine cytology and plasma polymerase chain reaction (PCR) assay. The primary objective of this study is to identify potential risk factors for the activation or reactivation of BK virus following kidney, simultaneous kidney-pancreas (SPK), and pancreas after kidney (PAK) transplant. Secondary objectives include the determination of the following at one-year post kidney, SPK, or PAK transplant: the incidence of BK viruria, BK viremia, BK nephropathy, and transplant rejection; the percentage of patients experiencing graft loss.

Methods: This study is a retrospective observational cohort review submitted to the Institutional Review Board for approval prior to its initiation. Patients who received a kidney, SPK or PAK transplant at the University of Wisconsin Hospital and Clinics between 01/01/2003 and 12/31/2007 with at least one year of follow up will be studied and data collected utilizing the Transplant Database System and medical record review. Data for analysis will include, but is not limited too: donor demographics, recipient demographics, disease that resulted in transplantation, procurement specifics, initial immunosuppressive regimen, and length of time from transplantation to first rejection episode and presence or absence of other post-transplant complications. Donor and recipient risk factors will be evaluated for their association with the development of BK virus using Kaplan-Meier analyses and Cox-Proportional Hazards models. Additionally, a Kaplan-Meier analysis will be completed to assess the impact of developing BK virus within the first year following transplant on subsequent rejection rates.

Results: Data collection and statistical analysis are in progress.

Learning Objectives:

Describe the incidence of BK viral infection following kidney, simultaneous kidney-pancreas, and pancreas after kidney transplant.

Examine potential risk factors for the development of BK viral infection.

Self Assessment Questions:

True or False. Approximately 30-40 % of kidney recipients display viral reactivation following transplant, however only 5 to 10% go on to develop BK virus nephropathy.

List 2 potential methods used to screen for a BK viral infection:

BONE HEALTH MANAGEMENT IN PROSTATE CANCER PATIENTS RECEIVING ANDROGEN DEPRIVATION THERAPY

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Background: Androgen deprivation therapy (ADT) is recommended for the management of locally advanced and metastatic prostate cancer. Patients receiving ADT undergo a rapid decline in bone mineral density during the first 6 to 12 months of initiating therapy. The World Health Organization (WHO), National Osteoporosis Foundation (NOF) and National Comprehensive Cancer Network (NCCN) created guidelines to prevent and manage osteoporosis. Additionally, the WHO has also developed and implemented the Fracture Risk Assessment Tool (FRAX) to predict the ten year risk of a major fracture.

Purpose: This study aims to characterize the current management of bone health in patients receiving ADT based on guideline compliance and identify predictors of appropriate management.

Methods: Patients receiving a luteinizing hormone-releasing hormone (LHRH) at Karmanos Cancer Center between January 1, 2007 and January 1, 2009 will be identified via the pharmacy database. Patients between the ages of 18 and 89 with prostate cancer without a history of metastatic bone lesions will be included. Records for these patients will be reviewed retrospectively from time care was initiated until either metastatic lesions are identified in the bones or August 1, 2009 (whichever occurs first). Data collected includes: demographics, past medical history, medication regimen, history of androgen deprivation therapy, bone health and its management. Collected information on bone health includes: fracture history, bone mineral density screening data, assessment of secondary risk factors for osteoporosis and bone health management. The ten year fracture risk will be calculated using the FRAX tool.

Learning Objectives:

Describe the fracture risk in the prostate cancer population

Identify predictors of suboptimal bone health management

Self Assessment Questions:

True or false. The use of androgen deprivation therapy in prostate cancer management predisposes patients to develop osteoporosis.

True or false. The supplementation of calcium and vitamin D is indicated in all patients with prostate cancer over the age of 40 receiving androgen deprivation therapy.

RELATIONSHIP OF TACROLIMUS AND SIROLIMUS BLOOD CONCENTRATIONS WITH REGARDS TO GRAFT-VERSUS-HOST DISEASE

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Purpose: Acute graft-versus-host disease (GVHD) is a major complication of stem cell transplant (SCT). Patients undergoing SCT at our hospital currently receive both tacrolimus and sirolimus as GVHD prophylaxis. Blood concentrations of these medications are routinely monitored for efficacy and toxicity. The purpose of the current study is to determine the relationship of tacrolimus and sirolimus blood trough concentrations and the incidence of acute GVHD and nephrotoxicity.

Methods: This study was a retrospective chart review conducted at the Indiana University Simon Cancer Center in Indianapolis, Indiana. Inclusion criteria included patients who received a matched related or matched unrelated, myeloablative, allogeneic stem cell transplant between January 2007 and September 2009, age > 18, and received tacrolimus and sirolimus for GHVD prophylaxis. The primary endpoint was the relationship of acute GVHD grades II-IV and mean blood trough concentrations of tacrolimus and sirolimus up to day 100 post transplant, death, or the incidence of acute GVHD. Secondary endpoints included the relationship of tacrolimus concentrations and acute renal failure, relapse of disease and infectious complications.

Results: Retrospective chart review was performed for 70 patients. The average age was 42.1 (range 21-59). Fifty percent of patients were male and 57% of patients underwent transplant from a matched unrelated donor (MUD). Results will be presented at the Great Lakes Residency Conference.

Learning Objectives:

Describe the development of and risk factors for acute graft-versus-host disease.

Recognize the importance of monitoring tacrolimus and sirolimus blood concentrations.

Self Assessment Questions:

Recent data would indicate the incidence of graft-versus-host disease following allogeneic transplant is
a. 20%
b. 40%
c. 60%
d. 80%

Which of the following increases the risk for acute GVHD
a.Infectious complications
b.HLA mismatching
c.Matched related sibling
d.Conditioning regimen

EVALUATION OF ANALGESIC USE IN CARDIOTHORACIC SURGERY PATIENTS AND IMPLEMENTATION OF BEST PRACTICES

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Purpose: The Institute for Safe Medication Practices has identified opioid analgesics as being high risk medications, and has outlined strategies for risk minimization which include the standardization of medication ordering and administration. Inconsistency in ordering and administration practice also puts patients at risk for poor pain control and has been identified by a regulatory agency as an area frequently requiring improvement. Primary objectives of this project are to characterize current analgesic use, to minimize therapeutic duplication of analgesics on the active medication profile, and to improve consistency in pharmacist order entry practice. The secondary objective is to determine the incidence of acetaminophen usage exceeding four grams in 24 hours from all sources.

Methods: A retrospective chart review was completed for 50 patients who underwent coronary artery bypass grafting or heart valve replacement at a 500-bed community teaching hospital between January and March of 2009. Patients using scheduled analgesics for 14 or more days prior to admission and patients undergoing thoracotomy were excluded. The following data were collected: patient demographics, pertinent laboratory values, analgesics on the active medication profile, analgesics administered, 24 hour acetaminophen usage, and pain ratings. Additionally, surveys were used to assess nursing analgesic administration and pharmacist analgesic order entry practices. Published guidelines for best practices and the findings of the chart review and clinician surveys are being used to drive changes to pre-printed order sets and to define expectations for pharmacist therapeutic intervention and order entry. Post-implementation, the impact of these changes will be assessed in a similar patient population.

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

Learning Objectives:

Identify resources for current best practices related to analgesic use.

Describe risk reduction strategies pertinent to the use of analgesics in acute care facilities.

Self Assessment Questions:

List three organizations that provide best practice recommendations regarding the use of analgesics.

List three interventions that could be implemented in a hospital setting to reduce the risk of patient harm associated with the use of opioid analgesics.

A RETROSPECTIVE EVALUATION OF THE APPROPRIATENESS OF ANTIEPILEPTIC SERUM DRUG CONCENTRATION MONITORING

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Purpose:
Serum drug concentration monitoring is utilized by healthcare providers to help individualize therapy for each patient. When serum drug concentrations are within a specific reference range known as the therapeutic range, it is associated with a more efficacious response while also decreasing the likelihood of experiencing adverse events. Though serum drug concentrations may be readily available, the utilization of serum drug concentrations should correlate with a clinical indication to minimize healthcare expenses. The purpose of this study is to evaluate whether antiepileptic serum drug concentrations were ordered appropriately based on specific indications and assess the timing of serum drug concentration drawn relative to doses administered.

Method:
A retrospective chart review will be conducted evaluating antiepileptic serum drug concentrations drawn at Riley Hospital for Children. Each serum drug concentration will be evaluated individually on appropriateness based on the following indications: initiation of drug therapy, change in drug therapy, verification of compliance, signs and symptoms of toxicity, new incidence of seizure activity despite adequate therapy. The timing of serum drug concentration drawn will be assessed relative to doses administered. Data collection will consist of the following: age, gender, weight, height, diagnosis, indication for antiepileptic drug therapy, drug, dose, frequency, route, concentration, BUN, Scr, Total bilirubin, albumin, ALT, AST.

Results:
Data collection is currently on going. Results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference

Learning Objectives:

Understand how the use of antiepileptic serum drug concentrations assists in individualizing patient drug therapy.

Identify situations when it is clinically indicated to draw antiepileptic serum drug concentrations.

Self Assessment Questions:

List three indications to draw antiepileptic serum drug concentrations?

True or False: The therapeutic range for an antiepileptic serum drug concentration is uniform to all patients?

IMPACT OF PHARMACIST INTERVENTION ON ASTHMA PATIENTS SEEN IN THE EMERGENCY DEPARTMENT

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Purpose: The primary objective of the study is to assess the impact of pharmacist intervention and patient education on hospital emergency room visits for asthma. Secondary objectives are to compare overall hospitalization rates, appropriate use of controller medications and scheduling of follow-up care in the study group participants pre- and post-intervention.

Methods: A retrospective chart review was completed for patients 18-56 years old who were seen in the emergency department (ED) of Saint Josephs Hospital, a level II trauma center, from January 1, 2008 to December 31, 2008, with a primary visit related to asthma as defined by International Classification of Diseases, 9th Revision (ICD-9) codes 493.00-493.92. Patients without a previous diagnosis of asthma were excluded. The following data were collected from the medical records: patient age, gender, documented asthma diagnosis, current medications, previous emergency department visits, follow-up visits and prescription refill information, if available. Following the chart review, a prospective group of patients identified by an ED physician with an asthma exacerbation will receive pharmacist intervention and patient education. Pharmacists will evaluate asthma treatment according to guidelines and intervene when necessary, then communicate and document changes to therapy and recommended follow-up. The two study groups will be compared based on ED re-visits for asthma, rate of hospitalizations, provider compliance with guideline-based follow-up care and appropriate use of controller medications.

Results/Conclusion: Research is in the data collection phase. Final results and conclusions will be presented at the Great Lake Pharmacy Resident Conference.

Learning Objectives:

Describe the consequences of uncontrolled asthma.

Identify measurement tools for asthma control.

Self Assessment Questions:

True or False. In America the estimated annual cost of asthma is about $18 million.

Which of the following describes the Asthma Control Test (ACT)?
a. ACT is a questionnaire used to ask patients about their asthma control
b. ACT will assess the patients asthma symptoms over the past month.
c. ACT is used to assess asthma control along with spirometry and physical assessment
d. All of the above are true about ACT

EFFICACY AND SAFETY OF INTRAVENOUS AND INHALED COLISTIN FOR GRAM-NEGATIVE INFECTIONS IN CRITICALLY ILL PATIENTS

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Purpose: Throughout the last decade, the emergence of multi-drug resistant (MDR) gram negative pathogens including Pseudomonas aeruginosa and Acinetobacter baumannii has steadily increased, and is associated with increased morbidity and mortality in critically ill patients. These pathogens have acquired resistance to almost all available antimicrobial agents, and therefore severely limited the therapeutic choices available to treat infections caused by these pathogens. This trend requires us to revert to last line therapies such as the peptide antibiotic colistin for the treatment of the MDR pathogens. Colistin has historically been associated with reports of adverse renal and neurological effects and was therefore replaced with newer classes of antibiotics with wider spectrums of activity and reduced toxicities. Due to the variability of dosing recommendations in the literature, it is important to determine whether the current standard of practice at The Ohio State University Medical Center (OSUMC) with intravenous and inhaled colistin is safe and efficacious. A retrospective review of intravenous and inhaled colistin use at this institution will help us determine if we are optimizing therapy to effectively treat our patients while minimizing toxicity.

Methods: Patients admitted to the intensive care units at OSUMC between July 1, 2007 and July 31, 2009 who received colistin will be retrospectively evaluated to determine the efficacy and safety of colistin. Safety will be evaluated based on the occurrence of nephrotoxicity as defined by the RIFLE (risk, injury, failure, loss, end-stage) criteria established by the Acute Dialysis Quality Initiative. Efficacy will be assessed by clinical and microbiologic cure. In addition to efficacy and safety, secondary outcomes that will be assessed include mortality and hospital and ICU length of stay. This study has been approved by the Institutional Review Board (IRB).

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

Learning Objectives:

Define the role of colistin for use in the critically ill patient.

Identify risk factors associated with nephrotoxicity in patients receiving intravenous colistin.

Self Assessment Questions:

Risk factors for developing infections due to multi-drug resistant pathogens include which of the following:
a. severity of illness
b. prolonged hospitalization
c. overuse of broad spectrum antimicrobials
d. all of the above

True or False: Colistin is currently recommended in IDSA (Infectious Disease Society of America) guidelines as appropriate empiric antimicrobial therapy for patients admitted to the ICU with a history of multi-drug resistant gram negative pathogens.

DEVELOPMENT OF A SYSTEMATIC METHODOLOGY FOR HANDLING BLACK BOX WARNING MEDICATIONS

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Background: A Black Box Warning (BBW) is the strongest warning in prescription medication labeling from the Food and Drug Administration (FDA). The primary purpose of a BBW is to highlight specific information regarding safe medication use and is given to medications associated with a significant risk for developing serious adverse drug events (ADE). BBWs are most often added retrospectively to prescription labeling as a result of information gathered during post marketing surveillance. Therefore, it is crucial that health care systems initiate an appropriate medication review process to keep abreast of new safety information and warnings issued by the FDA. Currently, many institutions are challenged with implementing a medication use process that systematically and completely addresses medications with BBWs. This project centers on establishing an effective process for handling medications with BBWs at a 500 bed academic medical center.

Methods: A review of Froedtert Hospitals formulary identifying all medications with BBWs was conducted. A high priority list of medications with BBWs was developed based on adverse drug reports (ADR), reported medication error data and clinical judgment from a panel of reviewers. A systematic process will be developed for addressing safety issues for all formulary medications with a BBW. This will include how BBW information and recommended actions will be conveyed to appropriate medical personnel including physicians, pharmacists and nurses. In addition, a screening process will be incorporated to review new drugs that are added to the formulary to determine BBW status and handling. An organized approach will be created to distribute new medication information and safety updates as they become available. The recommended process will be reviewed by the institutions Medication Use Safety and Pharmacy Nutrition and Therapeutics (PNT) Committees for approval.

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

Learning Objectives:

Recognize the importance of medications with a black box warning.

Describe an effective process to systematically and completely address medications with BBWs at an academic medical center.

Self Assessment Questions:

True or False: All medications carrying a BBW include the warning at the time of initial FDA approval.

True or False: Improper prescribing and monitoring of medications with a BBW may result in a serious adverse drug event.

ASSESSMENT OF HYPERSENSITIVITY REACTIONS AND FEASIBILITY OF A 60 MINUTE RAPID INFUSION RITUXIMAB PROTOCOL AT A COMPREHENSIVE CANCER CENTER

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Purpose: The incidence of infusion reactions in patients with Non-Hodgkins lymphoma receiving rituximab is highest during the first infusion, with an incidence of 77%, and decreases with subsequent infusions. Due to this risk, infusions are gradually titrated, which may take more than three hours for completion depending on dose and tolerability. However, there are data to suggest that a rapid infusion protocol is safe for patients who withstand the first dose with minimal side effects. The purpose of this study is to assess the feasibility of a 60 minute rapid infusion rituximab protocol in the institutions outpatient infusion center by evaluating grade III and IV hypersensitivity reactions, time savings, and nursing satisfaction.

Methods: Patients with indolent or intermediate grade B-cell malignancy between the ages of 18 and 89 will be enrolled in this prospective, single institution, single arm study that will be approved by the investigational review board. Patients will be excluded with an absolute lymphocyte count > 10,000/L, enrolled on another clinical trial, allergic to murine-containing medications, exposure to rituximab prior to enrollment, or experienced a grade III or IV hypersensitivity reaction during first infusion of rituximab. The first dose will be given by standard titration as stated in the package insert. The second infusion will begin at 100mg/hr for 15 minutes and the remaining dose given over 45 minutes. Patients will receive 50mg of oral diphenhydramine and 650mg of oral acetaminophen as premedication. Time savings will be calculated using the difference in infusion length between cycle 1 and cycle 2 per patient. Nursing data collection will include monitoring vitals every 15 minutes, start and stop times of rituximab infusion, description and grading of hypersensitivity reaction, additional medication administered including rescue medications during infusion, and nursing post infusion survey.

Results: To be presented at Great Lakes Residency Conference.

Learning Objectives:

Describe published literature outcomes using rapid infusion rituximab.

Identify patients eligible to receive rapid infusion rituximab.

Self Assessment Questions:

Patients with increased lymphocytes have a decreased risk for rituximab hypersensitivity reaction.

Premedication in this study will include diphenhydramine, acetaminophen and hydrocortisone.

PHARMACIST MEDICATION RECONCILIATION AND DISCHARGE COUNSELING IN A HEART FAILURE POPULATION: INTERVENTIONS AND OUTCOMES

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PURPOSE

Pharmacist care is of particular value in a heart failure population. Heart failure is associated with considerable morbidity and mortality. Patients with heart failure are prime candidates for pharmacist intervention as their medication regimens are often complex. Due to the potential to reduce medical costs and improve clinical outcomes, the integration of pharmacists into collaborative care teams should be strongly encouraged. The purpose of this investigation was to determine how pharmacists are improving patient outcomes and avoiding costs in a heart failure population. The study involved evaluation of pharmacists interventions in a multi-facility system serving inpatients with confirmed or suspected heart failure.

METHODS

This study is a retrospective chart review performed at three adult hospitals in the same healthcare system. The medical records for 100 patients from each facility hospitalized between September 1, 2009 and November 30, 2009 were reviewed. Patients included in the study were at least 18 years of age with a suspected or confirmed heart failure diagnosis, and had an admission and/or discharge heart failure assessment performed by a pharmacist. Patients with dementia and patients from a skilled nursing facility were excluded. The documented pharmacists assessments were reviewed for interventions. The interventions were categorized according to type and the frequencies of each type were compared. Upon classification of pharmacist interventions, a single score was assigned to each intervention according to the Instrument for Characterizing Pharmacists Clinical Activities, developed by Overhage and Lukes. Finally, the cost impact from each potential adverse drug event was determined and the sum reported as total cost avoidance.

RESULTS/CONCLUSION

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

Learning Objectives:

Explain why patients with heart failure are prime candidates for pharmacist intervention.

Identify advantages of a pharmacist presence in the care of a chronic disease-state patient population.

Self Assessment Questions:

The American College of Cardiology and the American Heart Association have identified which of the following to be the most effective, yet least used measure for the care of heart failure patients?

A. Close observation and follow-up
B. Limitation of physical activity
C. Sodium restriction
D. Diuretic therapy

What is the average daily pill burden for a patient with heart failure?

A. 5
B. 7
C. 9
D. 11

INPATIENT PHARMACY TECHNICIAN PRACTICE REDESIGN POST-CPOE TO ADVANCE PHARMACY SERVICES

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Purpose: The project was conducted in order to redesign decentral pharmacy technician practice post-CPOE to advance pharmacy services. The following six objectives were completed: assessed pharmacists and pharmacy technicians perception of the pharmacy technician role; ranked all activities decentral pharmacy technicians could perform; developed time standards and evaluated the frequency of each of the highest priority activities to estimate the necessary FTE; made recommendations about which activities decentral pharmacy technicians should perform at UWHC and how many FTE were needed to perform the activities; planned and implemented the recommended decentral pharmacy technician role changes; and measured the impact of the newly implemented pharmacy technician staffing model.

Methods: An electronic survey was used to assess pharmacists and pharmacy technicians perception of the pharmacy technician role pre- and post-CPOE. A list of all activities decentral pharmacy technicians could perform was created from the activities the technicians currently perform at UWHC, tasks pharmacy technicians perform that were documented in the literature, and any ideas UWHC staff generated. A task force was formed that employed the Delphi method to evaluate and rank each idea in terms of its ability to support and fulfill pharmacy departmental strategic goals. The task force then grouped the activities into three categories: high priority, medium priority, and low priority. The time standard and frequency evaluation of each activity were assessed using direct-observation and self-reporting. Recommendations for which activities decentral pharmacy technicians should perform at UWHC were developed based on the prioritized activities list, time requirement assessments, and available FTE. Scheduling adjustments were made and training was designed in order to facilitate implementation of the recommended changes. The impact of the newly implemented pharmacy technician staffing model on accomplishment of the highest priority activities was measured.

Results: A description and assessment of the results will be presented.

Learning Objectives:

Describe pharmacists and technicians perception of the decentral pharmacy technician role at UWHC post-CPOE.

Explain why some of the highest priority decentral pharmacy technician activities were not being accomplished prior to the staffing changes.

Self Assessment Questions:

What was the highest priority decentral pharmacy technician activity at UWHC?

What were the high priority decentral pharmacy technician activities that were not being accomplished prior to the staffing changes?

EFFECT OF SELECTIVE SEROTONIN RE-UPTAKE INHIBITOR (SSRI) AND SEROTONIN AND NOREPINEPHRINE RE-UPTAKE INHIBITOR (SNRI) USE ON HYPERPROLACTINEMIA RELATED ADVERSE EVENTS

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Statement of purpose:
The primary goal of this study will be to compare the combined incidence of hyperprolactinemia associated adverse events (defined as amenorrhea, oligomenorrhea and/or galactorrhea) in female patients who receive SSRI/SNRI therapy compared to the incidence of hyperprolactinemia in the general population.

Statement of methods:
A retrospective chart review will be performed at North Chicago Veterans Affairs Medical Center (NCVAMC). Patients with an active prescription for SSRI/SNRI between June 1, 2006 and June 1, 2009 will be included in the analysis. The research team will consist of a pharmacy resident and a pharmacist. No data will be collected until after approval from the Institutional Review Board is obtained.

Inclusion Criteria: Female patients on an SSRI or SNRI for at least three weeks.

Exclusion Criteria: Patients with previous menstrual abnormalities, those who have a condition which may cause hyperprolactinemia or on a medication known/suspected to cause hyperprolactinemia.

Primary Objective: The incidence of hyperprolactinemia associated adverse events will be compared to the incidence of hyperprolactinemia in the general female population which is reported in the literature to be approximately 1%.

Secondary Objective: Incidence of hyperprolactinemia associated events by individual drug will be assessed by using the Analysis of Variance (ANOVA). In order to achieve 90% power, an alpha of 0.05, and an effect size of 0.4, there need to be at least 14 patients receiving each of the agents. A total of 98 patients are needed to achieve power and a maximum of 150 charts will be reviewed.

Summary of results to support conclusion: awaiting IRB approval
Conclusion: awaiting IRB approval

Learning Objectives:

Describe the possible mechanism by which SSRI/SNRIs may increase prolactin levels

Recognize symptoms of hyperprolactinemia

Self Assessment Questions:

What is the approximate rate of hyperprolactinemia in the general female population?

Which of the following is NOT a manifestations of hyperprolactinemia in females

RECURRENT URINARY TRACT INFECTIONS POST RENAL TRANSPLANT; WHAT ARE THE RISK FACTORS?

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Study Purpose:
To re-evaluate pre-established risk factors and determine if there are any novel factors that may predispose our unique patient population to recurrent UTIs post renal transplant. Studies have identified the following patient characteristics to increase the risk of UTI: female gender, advanced age, history of vesicoureteral reflux disease, azathioprine, prolonged period of hemodialysis before transplant, polycystic kidney disease, diabetes mellitus, and cadaveric donor. (3, 7) Our patient population is unique as it comprises patients that are at high immunologic risk for rejection and receive very potent immunosuppression. In addition, majority of transplant patients in our medical center are non-Caucasian and may show different risk factors compared to the previously study of USRDS which was 74% Caucasian. Our goal is to reevaluate these pre-established risk factors plus determine if there are any novel factors that may predispose our patients to recurrent UTIs after renal transplantation.

Methods:
Data Collection: Retrospective review of electronic medical records (EMR)
This will be a retrospective study of all adult patients (age >18 years old at transplantation) that received a renal transplant at the University of Illinois Medical Center in Chicago from January 2004 to March of 2008. Patients receiving multiple organ transplants or with a history of previous transplants will be excluded in this study.

Patients will be categorized as having a UTI based on the physician diagnosis and antibiotic prescribing by the physician as documented in the patients EMR. Recurrent UTI will require documentation of eradication of the initial infecting bacteria followed by a new episode of bacteriuria within 6 weeks after the end of therapy. Relapse is defined as infection with the initial infecting organism and reinfection with a different organism.

Results:
Data collection is still in process. No preliminary results available at this time.
Conclusions:
No conclusions available at this time.

Learning Objectives:

Identify novel potential risk factors for urinary tract infections post renal transplant.

Recognize the difference in patient populations between those who have been studied in the past and those included in this study

Self Assessment Questions:

Name 3 known risk factors for a UTI post renal transplant.

What was the definition of recurrent urinary tract infection used in this study?

CARDIAC SURGERY BLOOD GLUCOSE CONTROL: TRANSITIONING FROM INSULIN INFUSION TO SUBCUTANEOUS INSULIN

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Background/Purpose
The Surgical Care Improvement Project (SCIP) was organized to reduce complications with surgical procedures. SCIP -Inf-4, assesses 06:00 blood glucose (≤ 200 mg/dL) on postoperative day one and two with the surgery end date being postoperative day zero. While most cardiac surgery patients at Saint Joseph Hospital are started on an insulin infusion at the end of surgery, insulin infusions may be stopped early due to the transfer of a patient from the critical care unit or physician order. Current hospital protocol utilizes regular insulin when transitioning from insulin infusion to subcutaneous insulin, and prior data analyses have noted that not all cardiac surgery patients are at goal with SCIP measures. In an effort to meet SCIP measures and the protective benefits of blood glucose control, an insulin transitional protocol utilizing insulin glargine was developed. Since few studies have assessed or made recommendations on the proper dosing of insulin glargine when transitioning from intravenous to subcutaneous insulin, this study aims to evaluate the effectiveness of insulin glargine in comparison to regular insulin as a means of blood glucose control when transitioning off an insulin infusion.

Methods:
A pre- and post-protocol implementation observational review in the cardio-thoracic vascular unit. An insulin glargine transitional protocol was created and implemented through newletters, informational packets, and inservices. Patients included in the study met both SCIP inclusion and exclusion criteria, age 55-65, and transitioned off insulin infusion by postoperative day one. Outcomes include the percentage of postoperative days two and three 06:00 blood glucose levels ≤ 200 mg/dL, surgical site infection rate, and incidence of hypoglycemia

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

Learning Objectives:

Describe the effects of hyperglycemia on post-cardiac surgery patients.

List the objective of SCIP measure SCIP-Inf-4.

Self Assessment Questions:

True/False Hyperglycemia in patients without diabetes is not associated with poor outcomes.

Did the administration of insulin glargine compared to regular insulin significantly increase the incidence of hypoglycemia?

RECOGNITION AND MANAGEMENT OF ALPLRAZOLAM WITHDRAWAL IN THE INTENSIVE CARE UNIT: THE AMAZE STUDY

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BACKGROUND:
Severe withdrawal symptoms following abrupt discontinuation of benzodiazepines (BZD) are well-documented. Alprazolam appears to display unique withdrawal symptoms that can last longer than several weeks if unnoticed and will persist despite therapy with other BZD. This is believed to be an alprazolam-specific pharmacodynamic effect on the BZD site on the GABAA receptor complex. This withdrawal can be particularly problematic in mechanically-ventilated ICU patients. Case studies and series have shown patients experiencing alprazolam withdrawal have disproportionate requirements of analgesia and anxyioltic medications. This study may provide important information about alprazolam withdrawal in mechanically ventilated, critically ill patients and help to quantify analgesia, sedation, and anti-delirium pharmacotherapy requirements before and after re-initiation.

METHODS:
This investigator-initiated, single-center, retrospective study is conducted at University Hospital in Cincinnati, Ohio. Patients who received alprazolam while mechanically ventilated between August 2005 and July 2009 were identified. Patients included are adult medical, neuroscience, surgical/trauma, or cardiologic ICU patients mechanically ventilated longer than 24 hours. Preadmission alprazolam use is determined by medical record review of medication reconciliation, admission history and physical notes, and progress note documentation. Patients are categorized as documented, likely, or unknown preadmission use. The primary objective is to compare pre- and post-alprazolam reinitiation analgesia, sedation, and anti-delirium requirements by quantifying daily infusion doses and PRN requirements for sedative, analgesic, and anti-delirium medications (e.g., fentanyl, propfol, haldol, lorazepam). Intrapatient differences will be compared using paired statistics.

RESULTS AND CONCLUSIONS:
Results and conclusions are pending and will be presented at the Great Lakes Regional Pharmacy Conference.

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

Learning Objectives:

Discuss the clinical presentation and management of benzodiazepines.

Explain specific benzodiazepine pharmacodynamics.

Self Assessment Questions:

True or False:
Benzodiazepines have different pharmacologic receptor properties that may affect predicted therapeutic response after agent substitution.

Which of the following statements is TRUE?
A. Benzodiazepine withdrawal involves changes in the GABA(A) receptor only.
B. Half-life is not a factor in determining when benzodiazepine withdrawal may occur.
C. While potentially severe, benzodiazepine withdrawal cannot result in patient death.
D. The GABA(A) receptor has a pentametric structure.
E. All GABA(A) receptor subtypes are distributed evenly throughout all parts of the brain.

ASSESSMENT OF NUTRITION SUPPORT IN ACUTE PANCREATITIS

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Background: In the United States, acute pancreatitis accounts for approximately 210,000 hospital admissions annually. Pancreatitis associated with organ failure and/or local complications such as necrosis, abscess or pseudocyst is considered severe and is associated with longer hospitalizations, more frequent critical care area stays and mortality rates of 10-25%. Nutrition support should be initiated when it becomes evident that the patient will not be able to consume adequate nourishment by mouth for several weeks. Practice Guidelines in Acute Pancreatitis (PGAP), endorsed by the American College of Gastroenterology, recommend the use of enteral feeding as the preferred initial nutrition support attempt because it is associated with fewer complications when compared to parenteral nutrition. For patients unable to tolerate enteral nutrition or who have a contraindication to enteral nutrition, parenteral nutrition is recommended.
Purpose: To determine the proportion of patients who received initial nutrition support in accordance with PGAP in acute pancreatitis patients at Akron General Medical Center (AGMC) and to evaluate the association between initial choice of nutrition support and subsequent hospital visit and prescribing physician service.
Methods: This IRB approved observational retrospective cohort study will be performed to evaluate initial nutrition support in patients with a discharge diagnosis of acute pancreatitis. Patients to be included are those admitted to AGMC between January 1st 2006 and December 31th 2009; >18 years of age at the time of admission; discharge diagnosis of acute pancreatitis; and placed on nutrition support. Patients admitted on parenteral or enteral feeds will be excluded. Data to be collected include type of nutrition received, patient demographics, cause of pancreatitis, total length of stay, total length of feeding, feeding length of stay, readmission, contraindications to enteral nutrition and the prescribing physician service.
Results and conclusions: Data analysis in progress, results to be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Describe nutrition support for acute pancreatitis as outlined in the PGAP.

Discuss the adherence to PGAP at AGMC.

Self Assessment Questions:

True/False: Enteral nutrition is always indicated as the initial choice of nutrition support in patients with acute pancreatitis.

In which patients should TPN be considered for initial nutrition support in acute pancreatits?
a.Patients unable to tolerate enteral feedings
b.Patients with a contraindication to enteral nutrition (e.g. bowel obstruction)
c.All patients should receive TPN
d.All patients should never receive TPN
e.Both A and B are correct

RETROSPECTIVE REVIEW OF PRESCRIBED THROMBOLYTICS: THE SAFE AND APPROPRIATE USE OF T-PA IN THE EMERGENCY DEPARTMENT

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BACKGROUND: There is high risk to patients associated with use of tissue plasminogen activator (t-PA) in the emergency department (ED). Focused patient evaluation and accurate dosage determination are imperative to patient safety.

PURPOSE: The goal of this study is to review t-PA prescribing, dispensing, and administration practices when used for FDA-approved and guideline-supported indications in the ED. If inconsistencies with proposed labeling and guidelines exist, development of a formal t-PA protocol may improve related processes of care and patient safety in the ED.

METHODS: This is a single-center, retrospective study of patients with acute ischemic stroke, massive pulmonary embolism, or cardiac arrest with pulseless electric activity who received t-PA in the ED between July 2004 and July 2009. Patients who received t-PA for any other reason are excluded. The primary outcome measures are the dosage, administration rate, and timing of t-PA both prescribed and administered. Secondary outcomes include major and minor bleeding, including intracranial hemorrhage, and presence of contraindications to therapy.

RESULTS AND CONCLUSIONS: The primary and secondary outcomes are still under investigation. In total, 1,816 patients who presented between July 1, 2004 and June 20, 2009 have been screened for inclusion. Fifty-four patients have been included and are currently being evaluated. Results will be presented at the Great Lakes Pharmacy Residency Conference.

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

Learning Objectives:

List absolute contraindications to systemic t-PA therapy.

Identify an appropriate t-PA dose for treating a patient with acute ischemic stroke, massive pulmonary embolism, or cardiac arrest with pulseless electric activity.

Self Assessment Questions:

Which of the following is not an absolute contraindication to t-PA?
a)Age > 75 years
b)Patients receiving therapeutic anticoagulation with an INR of 2.5 (i.e. warfarin)
c)Previous intracranial hemorrhage
d)Seizure at onset of stroke

T/F: In the management of a massive pulmonary embolism, an appropriate t-PA dose is 0.9 mg/kg IV up to 90 mg (10% as a bolus, then 90% as an infusion over 1 hour).

EVALUATION OF DEXMEDETOMIDINE FOR PATIENTS WITH RESPIRATORY DISTRESS ON NONINVASIVE MECHANICAL VENTILATION (NIMV) TO PREVENT INTUBATION: A CONTROLLED, RETROSPECTIVE STUDY.

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Purpose: Patients in respiratory distress often require mechanical ventilation for breathing assistance. One advantage of noninvasive mechanical ventilation (NIMV) compared to invasive ventilation is reduced incidence of ventilator-associated pneumonia, which may decrease intensive care unit (ICU) length of stay and decreased hospitalization costs. However, delirium and agitation are common in ICU patients and these complications can lead to failure of NIMV and need for invasive ventilation.

Dexmedetomidine, a highly selective alpha-2 agonist, is an agent commonly used for cooperative sedation without respiratory depression, along with anxiolysis. It has played a role in facilitating compliance with NIMV to prevent invasive intubation. The purpose of this study is to evaluate the efficacy of dexmedetomidine to prevent invasive mechanical intubation in patients with respiratory distress. Patients will be divided into two groups based on whether NIMV was used alone or with dexmedetomidine, and outcomes will be evaluated and compared between the groups.

Methods: This is a retrospective chart review. Patients will be divided into 2 groups: a control group and a treatment group that received dexmedetomidine. The primary outcome will be rates of intubation. Secondary outcomes will be the success rate of coming off NIMV, length of time tolerating NIMV, ICU length of stay, and hospitalization costs. Patients will be included in the study if they meet the following criteria: at least 18 years of age, patient in the ICU, on NIMV for respiratory distress, and a PaO2/FiO2 <200. Patients will be excluded if they meet the following criteria: invasive mechanical intubation and patients with a history of obstructive sleep apnea.

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

Learning Objectives:

Discuss the utility of noninvasive mechanical ventilation in patients with respiratory distress

Describe the potential role of dexmedetomidine for the use of noninvasive mechanical ventilation based on the current study

Self Assessment Questions:

1. Dexmedetomidine has been associated with the following properties:
   I. Analgesia
   II. Anxiolysis
   III. Sedation
   IV. Respiratory depression
   V. Only I, II, III
   VI. All of the above
2. What type of patients in respiratory distress has noninvasive mechanical ventilation been shown to be beneficial?
   I. Immunocompromised
   II.COPD
   III. Cardiogenic pulmonary edema
   IV.Only II
   V.All of the above

ADMINISTRATION TECHNIQUE AND STORAGE OF DISPOSABLE INSULIN PENS REPORTED BY PATIENTS WITH DIABETES

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Purpose:
Improper insulin injection technique or storage may facilitate unsafe or inadequate insulin treatment and patients with diabetes may achieve better therapeutic outcomes if emphasis is placed on periodic reassessment and education of injection technique and storage. The primary objective of this study is to determine insulin injection technique and storage of disposable insulin pens reported by patients with diabetes. Secondary objectives are to determine if patients certainty in technique, initial education on insulin pen injection technique, years of insulin therapy, duration of insulin pen use, or hemoglobin A1C correlate to reported technique and storage.

Methods:
This is a cross-sectional study at an academic medical center internal medicine outpatient clinic. Pharmacists at the internal medicine clinic will administer an original survey created from evaluation of pen manufacturer instructional guidelines, inquired information from manufacturers, and articles referencing insulin injection technique and storage. Patients with diabetes will be included if they are 18 years of age or older and are currently being prescribed Sanofi Aventis SoloSTAR, Novo Nordisk FlexPen, Eli Lily KwikPen, or Eli Lily original disposable pen for at least four weeks. Patients will be recruited during an encounter with the primary care physician. A pharmacist will enter the room, explain the parameters of the study, and ask the patient the survey questions. Wilcoxon rank sum tests will evaluate associations of correct usage scores with certainty of technique and initial education on insulin pen injection technique. Associations of correct usage score with years of insulin therapy, duration of specific pen usage, and hemoglobin A1C will be assessed by Jonckheere-Terpstra tests for ordered alternatives.

Results:
Results are expected to demonstrate the importance of periodic reassessment and education of insulin injection technique and storage.

Learning Objectives:

Identify the most frequent patient errors in insulin pen injection technique and storage.

Discuss the implications of initial patient education and reassessment with proper insulin injections technique and storage.

Self Assessment Questions:

True or False: Manufacturers of insulin pen devices encourage patients to store open or "in use" insulin pens in the refrigerator between injections.

The time required to deliver insulin using a pen device
A. increases with increasing air in cartridges
B. decreases with increasing air in cartridges

ASSESSING THE IMPACT OF PHARMACY INVOLVEMENT IN A VETERANS AFFAIRS PALLIATIVE CARE WARD: BEGINNING A NEW SERVICE

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Purpose: To determine if clinical pharmacy presence improves Quality Measures/Quality Indicators (QM/QI) in a Veterans Affairs (VA) palliative care ward.

Methods: A five-month retrospective comparison of changes in facility quality indicators was conducted in a VA palliative care ward. QM/QI are facility measures used in VA nursing homes to assess the quality of care at the facility as well as compare the facility with other VAs in the nation. Measures analyzed included prevalence of depression symptoms without antidepressant therapy, use of nine or more medications, moderate to severe pain scores in long-stay residents, moderate to severe pain scores in short-stay residents, and prevalence of antianxiety/hypnotic use. All patients in the Battle Creek VA palliative care ward between October 1, 2009 and March 1, 2010 were enrolled in the study. Pharmacist intervention included attendance in weekly treatment team meetings, rounding on patients, and in-depth monthly chart reviews.

Results: After three months of intervention, eighteen palliative care patients have been enrolled in the study. Based on September data, 1.2% of palliative patients without antidepressant therapy had symptoms of depression, 7.4% of patients were on nine or more medications, and 5.0% of patients were on an antianxiety or hypnotic medication. Pain control was broken into two groups: long stay residents (patients on the ward for greater than 90 days) and short stay residents (patients on the ward for 90 days or less). At baseline, 4.9% of long-stay palliative patients and 14.9% of short-stay palliative patients had moderate to severe pain. By the completion of the study, it is expected that QM/QI ratings for these five measures will improve for patients in the palliative care ward.

Conclusion: The implementation of clinical pharmacy palliative care services over a time period of five months is expected to improve the clinical management of palliative care patients.

Learning Objectives:

Describe the rationale for clinical pharmacy involvement in a palliative care inpatient ward.

Identify the impact of initiating clinical pharmacy services in a palliative care inpatient ward.

Self Assessment Questions:

True or False: Clinical pharmacy involvement in a palliative care setting led to a decrease in the percentage of patients who experienced excruciating pain.

True or False: Clinical pharmacy involvement in a palliative care setting led to a decrease in the percentage of patients who received an antianxiety or hypnotic medication.

EVALUATION AND ASSESSMENT OF AN ALCOHOL WITHDRAWAL ORDER SET IN THE EMERGENCY DEPARTMENT

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Purpose: The purpose of this study is to evaluate the effectiveness and overall compliance of the current alcohol withdrawal protocol in the ED. The primary outcomes of the study will be to assess appropriate diagnostic tests ordered,appropriate assessment of patients with CIWA-Ar (Clinical Institute Withdrawal Assessment-Alcohol, revised), and appropriate medication management based on the CIWA-Ar score.In addition, secondary outcomes will analyze the delays in medication management secondary to overcrowding in the ED. These results may further lead to adjustments of the alcohol withdrawal protocol and/or further education to health-care providers on alcohol withdrawal management in the ED.

Methods:Prior to evaluation, the study was submitted to the Advocate Health Care Institutional Review Board for approval. A retrospective chart review will be performed using Picis Chart Archive, the ED electronic medical record system. Inclusion criteria included patients who presented in the ED with alcohol withdrawal symptoms assessed with CIWA-Ar scale during June 2009 to August 2009.Exclusion criteria included patients where withdrawal was ruled out and related to another alcohol related illness (e.g. intoxication, alcohol ketoacidosis). Data collected were patient demographics,triage time,disposition time,edwin score,patient disposition to admission to ACMC/discharge,diagnostic tests performed,vital signs,patient assessment: initial CIWA score assessment by protocol and appropriateness,medication management appropriateness including IV fluids, and any adverse drug events related to alcohol withdrawal protocol.

Results:Data collection and statistical analysis will be completed by April 2010. Final results with conclusion will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Identify the appropriateness of the CIWA-Ar scale in patients undergoing a alcohol withdrawal in Emergency Department

To recognize the factors limiting the optimal use of the CIWA-AR protocol in the Emergency department.

Self Assessment Questions:

Identify the factors that the CIWA-Ar scale evaluates in alcohol withdrawal patients?

When do patients usually present in the Emergency Department for alcohol withdrawal?

THERAPEUTIC ANTICOAGULATION WITH ENOXAPARIN IN OBESE PATIENTS: AN ANALYSIS UTILIZING PHARMACOKINETIC MODELING

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Purpose:
According to the latest projections from the World Health Organization, approximately 1.6 billion adults are overweight and 400 million adults are obese. Patients with extreme body weight measurements are often excluded from clinical trials, leaving clinicians with limited information when caring for this expanding patient population. The goal of this study is to create a pharmacokinetic model allowing for comparison of steady state anti-Xa, apparent clearance, and apparent volume of distribution in obese (total body weight > 120 kg) versus non-obese patients.

Methods:
This retrospective, cohort study was designed to compare population-based pharmacokinetic and pharmacodynamic parameters in obese and non-obese patients. All adult patients receiving therapeutic enoxaparin (1 mg/kg subcutaneously every 12 hours) with an anti-Xa level drawn during an inpatient hospital admission from January 1, 2006 - October 31, 2009 were screened for inclusion. The following baseline characteristics were collected about each patient: age, gender, weight, indication for anticoagulation, serum creatinine, and enoxaparin dose. Anti-Xa levels were evaluated according to the temporal relationship to administered enoxaparin doses. Statistical analysis will involve use of appropriate tests for descriptive, continuous and categorical data. The population-based pharmacokinetic analysis will be completed using a nonlinear mixed effects model.

Results:
Data collection and analysis was in progress at the time of abstract submission. Final results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Discuss the incidence of venous thromboembolism in obese patients

Describe previously published literature pertaining to enoxaparin dosing in obese patients

Self Assessment Questions:

1. True/False: Plasminogen activator inhibitor-1 upregulation likely contributes to the increased incidence of venous thromboembolism in obese patients.

2. True/False: Previously published literature evaluating enoxaparin dosing in obese patients definitively conclude that a dose adjustment is not necessary to maintain safety and efficacy.

OPTIMIZATION OF VANCOMYCIN DOSING IN INTERMITTENT HEMODIALYSIS PATIENTS UTILIZING HIGH-FLUX HEMODIALYSIS MEMBRANES

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Purpose: The high prevalence of Methicillin-resistant Staphylococcus aureus (MRSA) and extensive use of vancomycin has resulted in the emergence of MRSA with reduced susceptibility to vancomycin. Current Infectious Diseases Society of America guidelines recommend vancomycin trough serum concentrations between 15 and 20 mg／L. The optimal dosing strategy for vancomycin in high-flux dialysis membranes has not been established. The purpose of the study is to evaluate a dosing strategy for vancomycin in patients with chronic kidney disease stage 5 (CKD5) utilizing high-flux dialysis membranes "Fresenius Optiflux F-160"

Methods: This study is a prospective, open label clinical trial to evaluate a dosing strategy for vancomycin in adult CKD5 patients receiving inpatient hemodialysis in the period between January 1st and June 30th 2010. Adult patients (≥ 18 years) on pharmacokinetics service dosed by pharmacists are included. Patients who receive only one dose of vancomycin or do not have pre-hemodialysis vancomycin serum concentrations measured are excluded. Initial dose is calculated based on patients actual body weight, vancomycin volume of distribution (0.7 L), and the required vancomycin serum concentration (25 mg/L). If patients receive other doses than what is in the protocol, the pharmacist orders an additional dose to meet the initial dosing criteria. Serum drug concentrations are measured before each hemodialysis to ensure the concentration ≥ 15mg/L. Patients receive maintenance dose of 500 mg after each hemodialysis session. Primary end point is the percent of patients attaining a pre-hemodialysis serum concentration of ≥ 15 mg/L.

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

Learning Objectives:

List the different vancomycin dosing strategies in high-flux hemodialysis patients

Discuss the importance of maintaining the vancomycin serum drug concentration ≥ 15 mg/l

Self Assessment Questions:

Given a patient who weighs 125 Kg on hemodialysis, devise a dosing strategy

List the main reason to maintain vancomycin serum drug concentrations ≥ 15 in hemodialysis patients

COMPARISON OF VANCOMYCIN TO ALTERNATIVE THERAPY FOR THE TREATMENT OF METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS (MRSA) ISOLATES WITH LOW AND HIGH MINIMUM INHIBITORY CONCENTRATIONS (MICS).

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PURPOSE:
Methicillin resistant Staphylococcus aureus (MRSA) is one of the leading causes of bacteremia in hospitalized patients. In recent years, there is what appears to be an upward trend in vancomycin MICs for MRSA. The purpose of this study is to compare clinical and microbiological outcomes in vancomycin and daptomycin treated patients with MRSA bacteremia in the setting of low (<2 mg/L) and high (≥2 mg/L) vancomycin MICs.

METHODS:
This is a retrospective chart review of patients 18 years and older with at least one positive blood culture for MRSA between August 2000 and August 2009. Patients were included if they were treated with vancomycin or daptomycin for at least 80% of their treatment course. Patients who had osteomyelitis, pneumonia, empiric treatment with an anti-MRSA agent for more than 72 hours, and/or polymicrobial bloodstream infections were excluded. The primary endpoint was clinical cure rates. Secondary endpoints were time to microbiological cure, relapse rates and failure rates. A comparison of adverse events between groups took place based on documented events in the patients hospital charts. Patients were stratified into one of three groups based on vancomycin MIC and treatment drug. Group 1 included vancomycin treated patients with MICs <2 mg/L. Group 2 included vancomycin treated patients with MICs = 2mg/L and Group 3 included patients treated with daptomycin for MRSA isolates with vancomycin MICs ≥2mg/L. Demographics (age and gender), microbiology results, medications, comorbidities, and pertinent monitoring parameters were collected for each patient.

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

Learning Objectives:

Recognize when MRSA isolates are no longer susceptible to various agents

Describe the concerns associated with the treatment of MRSA with increased vancomycin MICs.

Self Assessment Questions:

According to the CLSI guidelines, what is the current MRSA breakpoint for vancomycin?
a) 1 mg/L
b) 2 mg/L
c) 4 mg/L
d) 8 mg/L

True or False. It is proven that patients with elevated MICs to vancomycin have worse outcomes in MRSA infections.

EVALUATION OF CONVERTING PATIENTS FROM A CONTINUOUS INSULIN INFUSION TO SUBCUTANEOUS INSULIN GLARGINE IN THE TRAUMA/NEUROCRITICAL CARE SETTING

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PURPOSE:
To evaluate the methods for transitioning trauma/neurocritical care patients from continuous insulin infusion to subcutaneous insulin glargine.

BACKGROUND:
Studies have shown that managing blood glucose levels results in a significant reduction in the risk of morbidity and mortality. Due to the beneficial effects, the use of continuous insulin infusions in the trauma/neuro population is a standard of therapy; however, the conversion from this infusion to a subcutaneous insulin regimen has not been thoroughly addressed in the literature.

METHODS:
For this study, we conducted a retrospective chart review of patients who were converted from a continuous insulin infusion of regular insulin to subcutaneous insulin glargine at Bronson Methodist Hospital in Kalamazoo, Michigan, from October 2007 to October 2009. Trauma, neurotrauma, and neurocritical care patients that received a continuous insulin infusion and were transitioned to insulin glargine were selected for analysis. The first 100 patients that met criteria were selected for this retrospective, observational study. Patients younger than 18 years of age and pregnant females were excluded. Patient data collected includes basic demographics, nutrition source, total 24-hour insulin drip requirements and corresponding blood glucose values, total number of doses and units of insulin received subcutaneously for 48 hours following conversion, and total number of hyperglycemic, hypoglycemic, and euglycemic events for the 48 hours following conversion. Euglycemia was defined as a blood glucose reading between 80 and 180mg/dL.

RESULTS/CONCLUSIONS:
The research is in the data collection phase. The final results and conclusions will be presented at the Great Lakes Regional Conference.

Learning Objectives:

List potential complications of hypoglycemia and hyperglycemia in trauma and neurocritical care patients.

Identify an appropriate subcutaneous regimen for patients converting from a continuous insulin infusion.

Self Assessment Questions:

True/False: There is a nationally recognized conversion method for switching patients from a continuous insulin infusion to subcutaneous insulin glargine.

Which of the following are the established and universally accepted euglycemic blood glucose values for neurocritical care patients?
A) 80 - 110 mg/dL
B) 100 - 200 mg/dL
C) 110 - 150 mg/dL
D) None of the above

SWITCHING FROM EZETIMIBE/SIMVASTATIN TO ROSUVASTATIN: IS IT EFFICACIOUS?

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PURPOSE

Recent data indicates ezetimibe/simvastatin may not reduce clinically significant endpoints, specifically carotid artery thickness. Further studies are being conducted to determine if other clinical endpoints such as cardiovascular events are reduced with ezetimibe/simvastatin. However, until further results are available, many hyperlipidemia patients are being switched from ezetimibe/simvastatin to rosuvastatin. The objective of this study is to determine the effect on the lipid profile and evaluate the safety and tolerability of switching from ezetimibe/simvastatin to rosuvastatin.

METHODS

A retrospective chart review of hyperlipidemia patients at the Richard L. Roudebush Veterans Medical Center who were switched from ezetimibe/simvastatin to rosuvastatin from July 1st, 2008 through September 15th, 2009 is currently being conducted. Patients were excluded from the study if they were on either ezetimibe/simvastatin or rosuvastatin for less than 6 weeks, if the duration between ezetimibe/simvastatin and rosuvastatin use was greater than 6 months, or if no labs were drawn following the switch to rosuvastatin. Baseline characteristics collected for each patient include patient age, gender, ethnicity, height, and weight. Social history including alcohol use, tobacco use, and exercise is also being collected. To measure efficacy, refill history for rosuvastatin and ezetimibe/simvastatin, change in dose, compliance with rosuvastatin and ezetimibe/simvastatin, lipid panels before and after the switch, patients at LDL goal, and other concomitant cholesterol medications are being collected. Safety will be assessed by collecting liver function tests, creatinine phosphokinase, reported muscle pain, death, and documented cardiovascular events.

RESULTS/CONCLUSIONS

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

Learning Objectives:

Determine if rosuvastatin is as efficacious as ezetimibe/simvastatin in decreasing LDL levels and reaching LDL goals.

List at least two side effects observed after switching from ezetimibe/simvastatin to rosuvastatin in this study.

Self Assessment Questions:

T/F: Previous studies have shown that rosuvastatin is more efficacious at reducing LDL levels than ezetimibe/simvastatin.

Which of the following side effects is NOT a common side effect of rosuvastatin?
a)Elevated liver function tests
b)Hypokalemia
c)Headache
d)Myalgia

SPECIALIZED OUTPATIENT PHARMACY SERVICES FOR PATIENTS WITH MULTIPLES SCLEROSIS

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Purpose:

Disease-modifying medications, such as interferon beta and glatiramer acetate, are the only treatments currently available to likely slow down the progression of multiple sclerosis (MS). These agents have adverse effects that may be poorly tolerated and lead to noncompliance of therapy. The objectives of the specialized services are to increase distribution of medications for MS through Aurora Pharmacy and to increase patient compliance with disease-modifying medications.

Method:

When a prescription for a disease-modifying medication is received from the Regional MS Center, pharmacists from Aurora Pharmacy will determine insurance coverage for the medication. If Aurora Pharmacy is able to dispense the medication, a pharmacist will have a private consultation with the patient and/or their caregiver to provide injection training. A delivery or mail service will be offered. Follow-up phone calls will be conducted at week two, week four, and monthly thereafter for three months following the initiation of therapy. During the calls, the pharmacist will discuss various education topics related to MS, including side effect management and lifestyle modifications. All staff involved in care of the patient, including prescribers, pharmacists, nurses, and coordinators will be educated on the new service to facilitate implementation into existing workflows. A retrospective prescription volume evaluation will be conducted to compare the number of patients receiving disease-modifying medications for MS from the Aurora Pharmacy at baseline to post-implementation of program. Changes in compliance rates will also be evaluated by assessing refill consistency at baseline compared to at post-implementation of the service.

Preliminary Results:

At baseline from January to September of 2009, six patients received disease-modifying medications from Aurora Pharmacy. Refill consistency of those six patients was 100%. Data collection is still in progress; results and conclusions will be presented at Great Lakes Residency Conference.

Learning Objectives:

Describe the impact of pharmacist involvement in the compliance of disease-modifying medications for multiple sclerosis.

Identify the barriers to the development and implementation of a specialized service for patients with multiple sclerosis.

Self Assessment Questions:

Describe how the pharmacist can be involved in improving compliance of disease-modifying medications for multiple sclerosis.

List the barriers identified with the development and implementation of a specialized service for patients with multiple sclerosis.

JUSTIFICATION FOR CLINICAL PHARMACY SERVICES IN THE EMERGENCY DEPARTMENT OF A COMMUNITY, NON-TEACHING HOSPITAL

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BACKGROUND: Over the past decade, a large volume of data has been published illustrating opportunities for pharmacists to impact the care administered in an Emergency Department (ED). To date, the majority of data evaluating the utility of clinical pharmacy services in an ED has focused on large, university, teaching facilities.

PURPOSE: The primary objective of this study is to establish clinical pharmacy services in a community, non-teaching hospital ED and provide justification for the creation of a permanent clinical pharmacist position dedicated to emergency services.

METHODS: A pharmacist will provide clinical services in the ED from 1200 to 2200 every Monday, and 1300 to 2100 every Tuesday through Friday for a three month period. Interventions performed by the pharmacist will be recorded and categorized in a computer database. At the conclusion of the study, data will be sorted into predefined categories and analyzed to determine the potential cost savings of having a clinical pharmacist on site. Additionally, patients who present to the ED with acute heart failure exacerbation will be documented and analyzed separately to evaluate whether a clinical pharmacists interventions can routinely impact a specific disease state in the ED. A survey evaluating the ED staffs perceptions of the clinical pharmacists impact will attempt to capture interventions that improve care and/or medication safety but cannot be correlated directly to cost savings. The survey will be administered prior to the initial implementation of services to establish a baseline opinion. At the conclusion of the study period, a similar survey will be conducted to help evaluate the overall and long-term impact of ED clinical pharmacy services.

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

Learning Objectives:

Identify the opportunities for a clinical ED pharmacist in the setting of a community, non-teaching hospital.

Explain how interventions performed by a clinical pharmacist in the ED could justify a fulltime position, at a community, non-teaching institution.

Self Assessment Questions:

True or False: A majority of published data evaluating pharmacys role in an ED has been from community, non-teaching hospitals.

Which of the following interventions may be routinely performed by an ED pharmacist?
a. Identification of drug interactions
b. Antibiotic optimization
c. Anticoagulation dosing
d. Therapeutic recommendation
e. All of the above

ASSESSMENT OF BONE MINERAL DENSITY (BMD) IN HIV PATIENTS USING MEDROXYPROGESTERONE ACETATE AND TENOFOVIR COMPARED TO PATIENTS ON THE SINGLE AGENTS ALONE

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Purpose: The FDA has placed a "black box" warning on the label of medroxyprogesterone acetate regarding prolonged use of the injectable contraceptive leading to bone mineral density (BMD) loss. HIV-infected patients have been shown to have an increased risk for lower BMD. Additionally, tenofovir, a nucleotide reverse transcriptase inhibitor, has also been shown to have negative effects on BMD. The purpose of this study is to determine if the combination of medroxyprogesterone acetate and tenofovir containing products has an additive effect on BMD in HIV patients.

Methods: This observational case control study has been approved by the Institutional Review Board. The health systems electronic medical record system (EPIC) will be used to identify cases. The high risk group will be female patients seen in Nationwide Childrens Hospital Immunodeficiency Clinic who are using medroxyprogesterone acetate and tenofovir containing products concurrently for at least 6 months. The comparison groups will be female patients who are prescribed medroxyprogesterone acetate without tenofovir containing products, female patients prescribed tenofovir containing products without medroxyprogesterone acetate, and female patients prescribed other antiretroviral therapies not containing tenofovir. Demographic data will be obtained regarding patients age, ethnicity, HIV-infection status and medication use. The subjects will have a study appointment setup which will include a nutrition assessment by dietician, medication compliance assessment by pharmacist, lab draws consisting of 25-hydroxylvitamin D, calcium, Alkaline phosphate, and parathyroid hormone, and Dual Energy X-ray Absorptiometry (DEXA) scans ordered by physician. Mean t-scores will be calculated and compared with each group to determine if the high risk group is at greater risk.

Results/Conclusions: The research is in the data collection phase. Final results with conclusion will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

To list and describe risk factors for decreased bone mineral density in HIV-infected females.

To identify if the combination of medroxyprogesterone acetate and tenofovir has an additive negative effect on bone mineral density.

Self Assessment Questions:

True/False: HIV-infected patients are at greater risk for decreased BMD than HIV-uninfected.

Which antiretroviral has been associated with decreased bone mineral density?

IMPACT OF AN ACADEMIC OUTPATIENT RESIDENCY ON THE PROFESSION OF PHARMACY

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Purpose: With increasing demand for quality pharmacy residencies, colleges of pharmacy may be called upon to develop and support new programs. The Ohio State University College of Pharmacy (OSU) residency has a 10-year history with nationally recognized practice sites and fifty graduates. The primary goal of this program is to create change agents who will lead the profession of pharmacy. Our purpose is to identify the impact of OSU pharmacy residency graduates on the profession of pharmacy, to evaluate the programs suitability as a model for new/emerging community and ambulatory care residencies.

Methods: A complete roster of the fifty OSU Residency graduates will be obtained from the residency director and a database of contact information will be developed. Interview and survey questions will be developed by the study investigators and pilot-tested by OSU faculty members who are not former residents of the program. The methods will be refined based on their feedback. An email will be sent to all graduates inviting their participation and, if they consent, a request for an updated 2009 curriculum vitae. If a 2009 updated curriculum vitae is not available, the most recent version will be acceptable. OSU Residency graduates post-residency professional activities in clinical practice, teaching, scholarship, and service to profession will be initially elicited from PubMed searches and curriculum vitas. Any preliminary unobtainable information will be gathered from a one-on-one telephonic interview. Telephone conversations will be tape recorded, per permission from participant, and transcribed into written format. Finally, Qualtrics will be used to administer an anonymous online survey for participants to rate professional skills emphasized during residency and overall satisfaction with the program. SPSS will be used to analyze the results.

Results: This research is in the data collection phase. Final results with conclusion will be presented at the Great Lakes Pharmacy Conference.

Learning Objectives:

1) Identify the impact of OSU pharmacy residency graduates on the profession of pharmacy

2) Discuss the programs suitability as a model for new/emerging community and ambulatory care residencies

Self Assessment Questions:

True or False: Several national pharmacy organizations have issued statements recommending residency training as a requirement for entry into pharmacy practice.

What are some identifiable factors that make colleges of pharmacy ideal for developing pharmacy residency programs?

RISK OF CEREBROVASCULAR EVENTS ASSOCIATED WITH ANTIPYSCHOTIC USE.

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There are conflicting reports concerning antipsychotic use and risk for cerebrovascular events (CVE). The objective of this research is to determine the incidence of CVEs in patients exposed to antipsychotics. A major problem with investigating CVEs in patients on antipsychotics is controlling for the multitude of contributing variables that can augment a patients risk for CVE regardless of antipsychotic use. By including patients who are less than 65 years old in the study, it is hoped that the influence of contributing disease states and medications will be minimal in this population. Persons over 65 years old will be included for comparison. It is hypothesized that antipsychotic use does influence risk for cerebrovascular events.

A retrospective database review will be performed using the VISN-9 VAMCs CPRS and Kentucky Medicaid Association databases. The study population be patients prescribed an antipsychotic between 1998 and 2008. Inclusion criteria: ≥18 years old, patients newly started on outpatient antipsychotic therapy between 01/01/98 and 12/31/08, for Medicaid subjects: State of Kentucky CHFS Medicaid recipients for minimum of 11 months. Exclusion criteria: anticoagulant/antiplatelet therapy (excluding aspirin) during the 6 months prior to start of antipsychotic therapy; any of the following diagnoses prior to initiation of antipsychotic therapy: CHF, CVE, MI, PVD, CAD, coagulation disorders; patients with antipsychotic exposure during the year prior to January 1, 1998; patients on more than one antipsychotic at a time. Co-morbidities and medication use associated with increased CVE risk will be recorded. The dose and duration of antipsychotic therapy will be evaluated. After antipsychotic initiation, patients will be followed for 9 months for the occurrence of CVE. Medication possession ratio (MPR) for antipsychotic medications will be determined. Data will be analyzed using logistic regression, t-tests, and chi-square tests. This study has received IRB and R&D approval.

No findings, results, conclusions reached to date.

Learning Objectives:

Discuss the roles of confounding variables when evaluating the risk for cerebrovascular events in patients on antipsychotics.

Identify the patient populations at increased risk for cerebrovascular events.

Self Assessment Questions:

What is the significance of including patients less than 65 years of age in this retrospective study?

What is one of the largest limitations to previous studies evaluating stroke and risk for cerebrovascular events?

AT WHAT POINT IS TREATING LATE KIDNEY TRANSPLANT REJECTION MORE BENEFICIAL THAN RETURN TO HEMODIALYSIS?

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Purpose:
Kidney transplants have been proven to be more cost-effective than hemodialysis. When a patient suffers kidney rejection, aggressive immunosuppressive therapy is employed. It is unclear whether it is more cost-effective to treat late acute rejection or to prepare the patient for return to hemodialysis.

The primary objective of this study was to evaluate if treatment of late kidney transplant rejection leads to dialysis-free survival. Secondary objectives were to compare the cost-benefit of treating late kidney transplant rejection opposed to returning a patient to hemodialysis, evaluate the cause of late kidney transplant rejection, and assess rejection treatment-related mortality.

Methods:
This retrospective cohort review evaluated patients who underwent therapy for kidney transplant rejection greater than 6 months after transplant. Patients were identified through hospital kidney transplant and medication databases. Patients were included if they were at least 18 years of age, had kidney or simultaneous kidney-pancreas transplant, and underwent late kidney transplant rejection therapy at UCMC between January 1, 2000 to June 30, 2009. Data abstraction included electronic medical record assessment and chart review. Clinical outcomes of late kidney transplant rejection treatment were determined and adverse events resulting from therapy were noted. Patients received increased immunosuppression and were then classified as dialysis-free or dialysis-dependent based on the outcome. Pharmacoeconomic outcomes were evaluated through actual costs of procedures and drug therapies employed for each patient. Patient history was reviewed to evaluate the cause of late kidney transplant rejection.

Univariate and multivariate logistic regression models were employed for primary outcome variables. Kidney graft survival was computed as time from transplantation to death, last follow up, or return to hemodialysis. A cost-benefit analysis compared direct healthcare costs between primary outcome variables.

Results: To be presented

Conclusions: To be presented

Learning Objectives:

Identify if treatment of late kidney transplant rejection leads to an increase in dialysis-free survival

Discuss the economic cost of treating late kidney transplant rejection rather than returning a patient to dialysis

Self Assessment Questions:

How is late kidney transplant rejection typically treated?

Why might treating late kidney transplant rejection be more costly than a return to hemodialysis?

NEEDS ASSESSMENT AND IMPLEMENTATION OF A PHYSICAL ASSESSMENT WORKSHOP FOR PHARMACY RESIDENTS

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Purpose:
Pharmacists continue to transition from the hospital into clinic settings to provide direct patient care services. While literature supports the role of physical assessment training for pharmacy students, this support is currently lacking for pharmacy residents. Physical assessment training occurs early in the pharmacy curriculum, with limited reinforcement while in post graduate training or clinical practice. Based on a review of current physical assessment training programs, there are no known programs in the Great Lakes region. In this same region, multiple post graduate year one programs boost ambulatory care experiences along with 27 ambulatory care focused residencies. This project aims to fill the void of a lack of physical assessment training programs in the Great Lakes region to serve the multiple residents in clinic settings.

Methods:
Surveys will be sent to the residency directors in the Great Lakes region to assess their willingness to participate and gain knowledge into expectations for a physical assessment training program. Utilizing the survey results, a physical assessment workshop will be planned for ambulatory care residents in Indianapolis, Indiana in the spring of 2010. The workshop will utilize resources from Butler University and the design and lay out of the workshop will be decided upon with results of the earlier administered surveys. Surveys will be used the day of the work shop to gain a better understanding of how to proceed with workshops in the future and also to gage any changes in pharmacy residents perception of physical assessment. This feedback will be used to formulate a region wide workshop for the 2010/2011 residency training year.

Results:
Planning and implementing of a pharmacy resident physical assessment training program is ongoing and will be presented at Great Lakes Pharmacy Resident conference.

Learning Objectives:

Identify the barriers to physical assessment training for pharmacy residents

Recognize the benefit of physical assessment training to subsets of pharmacy residents

Self Assessment Questions:

True/False: Little data exists for physical assessment training past pharmacy school

List 5 of the physical assessment skills that are beneficial to a pharmacy resident in a clinic setting

IMPACT OF PROCALCITONIN (PCT) IN DETERMINING OPTIMAL DURATION OF ANTIBIOTIC THERAPY IN NURSING HOME PATIENTS WITH PNEUMONIA

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PURPOSE: Antimicrobial resistance is an increasing concern when treating patients with bacterial infections. One of the most difficult aspects in treating infections is determining the optimal duration of therapy to ensure clinical success and minimize the development of resistance. Pneumonia has been studied in an attempt to determine optimal duration of therapy. In ventilator-associated pneumonia (VAP), it was determined that 8 days of appropriate therapy was non-inferior to 15 days, for patients without a demonstrated non-lactose fermenter (Pseudomonas or Acinetobacter). Though nursing home patients with pneumonia (HCAP) have risk for similar organisms, there have not been studies to determine the optimal duration of treatment for these patients. Treatment is generally recommended for 7 to 14 days, based on clinical trends of the individual patient. Patient co-morbidities may make assessment of these trends ambiguous. Procalcitonin (PCT) is a FDA approved biologic marker that has been used for aiding duration of treatment in patients with community-acquired pneumonia (CAP), lower respiratory infections, and sepsis.

METHODS: This is a retrospective chart review of nursing home patients admitted to St. Francis Hospitals with the diagnosis of pneumonia. The study control group includes all patients meeting inclusion criteria during the time period of January 1, 2009 to December 31, 2009, when patients were treated according to usual practice without the use of PCT. The study period for patients in the PCT group is January 1, 2010 to December 31, 2010. The primary outcome will be duration of antibiotics for pneumonia. Secondary outcomes will measure length of stay (LOS), antibiotic related LOS, mortality, and recurrence rate. Subgroup analysis will be conducted for patients with PCT < 0.1, indicating antibiotics are encouraged to be discontinued.

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

Learning Objectives:

To determine the utility of procalcitonin (PCT) in nursing home patients with pneumonia.

Evaluate the impact of PCT on duration of antibiotic therapy, LOS, antibiotic related LOS, mortality, and recurrence rate.

Self Assessment Questions:

What are the barriers encountered when assessing duration of antibiotic therapy for this patient population?

What are the approved guidelines for PCT levels and how are those levels used to support clinical decision making?

EVALUATION OF VANCOMYCIN TROUGH LEVELS BEFORE AND AFTER IMPLEMENTATION OF PHARMACIST-DRIVEN VANCOMYCIN DOSING AND MONITORING GUIDELINES

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Purpose: In January 2009, a joint consensus review was published by the Infectious Disease Society of America, the American Society of Health-System Pharmacists, and the Society of Infectious Disease Pharmacists that provided an evidenced-based, standard approach for dosing and monitoring patients that receive vancomycin. Prior to this statement, there was not a standardized method for managing patients on vancomycin which led to considerable variability from both physicians and pharmacists. The consensus was driven by the need to ensure adequate trough levels to optimize the clinical efficacy of vancomycin and reduce the potential for resistance to vancomycin. Based on these recommendations, the system Pharmacy and Therapeutics Committee approved dosing and monitoring guidelines that increased the vancomycin therapeutic trough range and required pharmacists to dose and monitor all adult patients receiving vancomycin. This study will determine how standardization and implementation of a pharmacist-driven vancomycin dosing and monitoring guideline will affect the percent of levels in the vancomycin therapeutic trough range of 15.0 to 25.0 mcg/ml.

Methods: The study is a retrospective chart review performed at three adult hospitals in the same healthcare system. The percent of vancomycin trough levels within therapeutic range (defined: 15-25 mcg/ml) in the study group will be compared to those attained prior to guideline implementation (defined: 10-20 mcg/ml) in the control group. Secondary outcomes include whether pharmacists influence the use of vancomycin, number of overall vancomycin levels and length of vancomycin therapy. Excluded from the study were regimens for surgical prophylaxis, regimens that include trough levels not drawn or drawn incorrectly, regimens not managed by a pharmacist in the study group and pregnant and lactating women.

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

Learning Objectives:

Outline key recommendations regarding vancomycin as issued by the joint consensus review from IDSA, ASHP, and SIDP in January 2009

Explain specific rationale for the recommendation of a minimum trough level for vancomycin

Self Assessment Questions:

The recommended target trough level of vancomycin is:
a.15-20 mcg/mL
b.10-20 mcg/mL
c.<25 mcg/mL
d.5-10 mcg/mL

T/F: Minimum trough level should be maintained above 15 mcg/mL to avoid development of resistance.

STABILITY OF AQUEOUS N-ACETYLCYSTEINE SOLUTIONS FOR ORAL ADMINISTRATION IN THE TREATMENT OF MECONIUM ILEUS

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Purpose: N-acetylcysteine (NAC) is used for the treatment of meconium ileus in concentrations ranging from 1% to 10%. Studies suggest that 4% solutions effectively liquefy meconium by cleaving the sulfhydryl bonds to reduce the meconiums viscosity. Currently, C.S. Mott Childrens Hospital (University of Michigan Hospitals and Health Centers) dilutes 20% NAC solution with 0.9% sodium chloride for injection to produce a 5% NAC solution for oral, nasogastric and gastrostomy tube administration to infant patients. Although NAC solutions appear to effectively treat meconium ileus, studies assessing the stability of extemporaneous NAC solutions are lacking. We propose to extemporaneously formulate 1% and 10% NAC oral solutions by diluting the 20% NAC for inhalation with 0.9% sodium chloride for injection and determine the products stability over a 90 day period.

Methods: The 1% and 10% NAC solutions will be prepared by diluting commercially available 20% NAC inhalation solution with 0.9% saline for injection (with preservative) to make three identical samples of each concentration. Samples will be stored in 2 ounce amber plastic bottles with child-resistant caps. One milliliter will be withdrawn from each sample, diluted with mobile phase to an expected concentration of 50 g/mL, and assayed in duplicate using high-performance liquid chromatography immediately after preparation and at 7, 14, 30, 60 and 90 days. A five point standard curve will be analyzed using linear regression. Stability will be defined as 90% retention of the initial concentration. The concentration of NAC remaining at 90 days in each preparation will be compared with the concentration at each time interval and to the corresponding concentrations remaining in the 10% preparation using the Mann-Whitney U test. Statistical significance will be defined as a p value of less than 0.05. Institutional Review Board approval is not required.

Results: Pending

Learning Objectives:

Explain the differences between normal meconium and meconium ileus

Discuss the procedure for a stability study for N-acetylcysteine solutions

Self Assessment Questions:

1. The presence of which of the following components leads to the increased viscosity of meconium ileus relative to normal meconium:

A. Carbohydrates
B. Nitrogen
C. Mucoproteins
D. Mucopolysaccharides

2. What is the purpose of the stationary phase (column) in the HPLC pathway?

A. The column provides the non-covalent interactions to determine the degree of migration and separation of the samples components.
B. The column measures the samples ability to absorb light at certain wavelengths
C. The column records the samples ability to absorb light at certain wavelengths
D. None of the above

RETROSPECTIVE REVIEW OF OUTCOMES ASSOCIATED WITH A CLINICAL REMINDER FOR ATYPICAL ANTIPSYCHOTIC METABOLIC SYNDROME MONITORING

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BACKGROUND: Atypical antipsychotics have been associated with weight gain, diabetes, and dyslipidemia. Additionally, many patients who are treated with atypical antipsychotics may have increased risk for metabolic syndrome at baseline due to sedentary lifestyle. It is estimated that the prevalence of diabetes mellitus and obesity is approximately 1.5 to 2.0 times that of the general population in patients with schizophrenia and affective disorders. Therefore, it is imperative that clinicians monitor for metabolic changes in patients taking atypical antipsychotics to help reduce the long-term cardiovascular risks of diabetes and dyslipidemia.

OBJECTIVES: The purposes of this analysis are (1) to determine if patients with active atypical antipsychotic prescriptions are being monitored for metabolic complications in accordance with VA and APA guidelines using a new clinical reminder tool in the computerized patient record system; and (2) to determine whether compliance with the clinical reminder tool is similar for patients on low dose quetiapine (≤200mg) and all other atypical antipsychotics. Additionally, this analysis will compare rates of completion of the clinical reminder tool to prior methods of encouraging monitoring for metabolic complications.

METHODS: A retrospective chart review will be performed for all patients prescribed an atypical antipsychotic from 11/2008 to 11/2009. Data will be evaluated looking at low dose quetiapine versus all other atypical antipsychotics, including higher dose quetiapine. Approximately 800 charts will be reviewed to determine the timeliness of metabolic complication monitoring, including documented weight, BMI, fasting lipid panel, fasting blood glucose and hemoglobin A1c. Demographics including age, gender, ethnicity and past medical history of obesity, diabetes, dyslipidemia, or hypertension will also be collected. The frequency and accuracy of provider completion of the clinical reminder tool for metabolic monitoring will also be assessed. Compliance with the tool will be compared with prior methods of encouraging monitoring for metabolic complications.

RESULTS: pending

CONCLUSIONS: pending

Learning Objectives:

Identify APA requirements for metabolic syndrome monitoring with the use of atypical antipsychotics

Describe the rate of completion of metabolic syndrome monitoring in clinical practice

Self Assessment Questions:

How often is monitoring of fasting plasma glucose recommended by the APA in patients taking atypical antipsychotics?

True or False. When quetiapine is used at doses less than 200mg per day, metabolic syndrome monitoring is not necessary.

A PHARMACIST MANAGED CHRONIC OBSTRUCTIVE PULMONARY DISEASE SCREENING IN A COMMUNITY SETTING

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Purpose: Chronic Obstructive Pulmonary Disease (COPD) affects twelve million people in the United States and is the fourth leading cause of mortality with 120,000 deaths/year. Despite its prevalence, COPD is under diagnosed, specifically in early stages when symptoms may not be present. Spirometry is the gold standard for diagnosis and management of COPD, but there is controversy surrounding its utility as a screening tool. A pharmacist managed spirometry-screening may provide an accessible means to facilitate early identification and management of COPD and its risk factors.
Methods: During this pilot program, community pharmacists will administer a validated screening questionnaire to patients who meet inclusion criteria at four Kroger Patient Care Pharmacies and at off-site screening events. Patients who are interested will be offered a spirometry screening conducted by a NIOSH trained pharmacist. During the screening, the pharmacist will determine the FVC, FEV1, FEV1 /FVC and the calculated lung age. The results and full report from the spirometer will be printed and given to the patient as well as faxed to the primary care physician. Any patient, regardless of lung function, that has indicated current smoking status will be offered smoking cessation counseling. The successful implementation of this program will be evaluated by collecting the following information: screening questionnaire score of patients that are referred, percentage of results confirmed to be accurate by a pulmonologist, number of patients enrolled in smoking cessation or COPD management programs and percentage of referred patients with confirmed diagnosis. The significance of this project to pharmacy is that it will establish the role of the pharmacist in improving the early detection of patients with COPD through spirometry.
Preliminary results: Spirometry screenings are in the process of being implemented. Preliminary results will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Describe the risk factors and symptoms associated with chronic obstructive pulmonary disease.

Discuss the utility of spirometry screenings for COPD in a community pharmacy setting.

Self Assessment Questions:

Which of the following is the most common cause of COPD?
a.Asthma
b.Old age
c.Smoking
d.Family history

Lung function can be returned to normal with appropriate medication therapy and lifestyle changes.
a.True
b.False

EVALUATION OF INSULIN PLUS EXENATIDE IN A VETERAN POPULATION WITH TYPE 2 DIABETES MELLITUS

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Purpose: Insulin resistance is a major component of Type 2 diabetes mellitus (T2DM), and available agents to reduce insulin resistance have limitations. Practitioners at the VA Ann Arbor Healthcare System (VAAAHS) are using exenatide in addition to insulin in overweight veterans with severe, insulin resistant T2DM in an effort to increase insulin sensitivity. In clinical trials, exenatide has been shown to decrease hemoglobin A1c (A1c) and promote weight loss. Weight loss seen from exenatide use may have multifactorial benefits for a T2DM patient with severe insulin resistance. Literature suggests that weight loss alone can improve glycemic control. Currently there are no clinical trials evaluating exenatide and insulin in combination; however, case reports and small observational studies have suggested the combination does improve A1c, decrease insulin requirements, and decrease weight. The objective of this study is to assess the change in insulin dose requirements when exenatide is added to insulin for the treatment of T2DM in veterans at the VAAAHS.
Methods: The study has been approved by the VAAAHS Institutional Review Board. In this retrospective chart review, VAAAHS patients who have been prescribed exenatide were extracted from the prescription database. Patients must have a diagnosis of T2DM and have active prescriptions for both insulin and exenatide between July 2007 and July 2009 to be included. Patients will be excluded if they received exenatide for less than a one month duration. The following data will be collected from the electronic medical record: age, sex, ethnicity, height, weight, BMI, A1c, diabetic medications, exenatide dose, insulin dose, reported hypoglycemic episodes, reported GI adverse effects, or other adverse effects attributable to exenatide.
Preliminary results: A search of prescriptions for exenatide found 31 patients received this medication between July 2007 and June 2009. Of these 31 patients, 29 patients met study criteria.
Conclusions: To be reported

Learning Objectives:

Discuss the role of adipose tissue in insulin resistance

Explain the potential benefits of using the combination of insulin and exenatide in severely insulin resistant patients

Self Assessment Questions:

Adipose tissue, liver, and muscle can display insulin resistance; however, adipose tissue can also accelerate insulin resistance. True or False?

How does exenatide improve A1c and promote weight loss?
A. Works to enhance glucose-dependent insulin secretion by the pancreas, suppress glucagon secretion, and slow gastric emptying
B. Works to inhibit fat absorption in the intestine and decrease gluconeogenesis in the liver
C. Works to enhance glucose-dependent insulin secretion by the pancreas only
D. None of the above

GETTING TO GOAL AND STAYING THERE, EVALUATION OF A PHARMACIST-RUN ANTICOAGULATION CLINIC.

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Background: Warfarin is a medication with a narrow therapeutic window. It requires rigorous monitoring of patients international normalized ratio (INR) to keep patients within therapeutic range. Patients can experience delays in follow-up care as a result of increased physician office workload due to their need for frequent INR monitoring. Anticoagulation clinics were developed to help improve patient care by providing patients more aggressive follow-up care with frequent monitoring of INR and warfarin titration. Based on non-controlled studies, it is estimated that medical care with family physicians keep patients INR within range 50% of time and anticoagulation clinics improve care by at least 10%.
Purpose: The primary objective of this study is to evaluate the time to INR goal with new patients starting on warfarin and the management of maintenance patients within their INR goal 0.2. The secondary objectives are to identify the complications that patients have that keep them from being in goal range and evaluate if differences between pharmacists management exist.
Methods: This study was submitted for Institutional Review Board approval by expedited review. The study design is a retrospective review of patients from January 1, 2009 to June 30, 2009 from the St. Elizabeth Anticoagulation Clinic.
Results: In total, 421 patient records were analyzed. There are 44 new patients and the analysis showed that we took an average of 18 14 days to reach two consecutive INRs in the desired range. There are 377 maintenance patients and the analysis showed 76% of patients INRs were in the desired range.
Conclusion: This review showed that INRs were kept in desired range better than the averages seen in similar studies.

Learning Objectives:

Recognize the importance of anticoagulation clinics to patient care.

Identify the difference in patient care between anticoagulation clinics and physician managed therapy.

Self Assessment Questions:

What is the average percent that physicians keep patients INRs within range?
a.30%
b.45%
c.50%
d.65%
e.70%

True or False. Anticoagulation Clinics help keep patients within INR goal range 10% more than physician managed care.

SEASONAL VARIATIONS IN INTERNATIONAL NORMALIZED RATIO

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Objectives: European studies reported seasonal variation in International Normalized Ratio (INR); lowest values in summer and highest in autumn. Such fluctuations could have consequences for anticoagulation management; however, these have yet to be examined. Therefore, we sought to determine if seasonal variation occurred in American patients and if this resulted in different anticoagulation management requirements.

Methods: Our retrospective chart-review examined 31 patients (INR target 2-3) enrolled in a pharmacist-managed anticoagulation clinic. Previous studies found renal dysfunction was associated with INR fluctuation; therefore, to maximize detection of potentially subtle changes, we only included patients with estimated glomerular filtration rates >60 mL/min/1.73m2. For each clinic visit, we recorded INR and season; winter - December-February; spring - March-May; summer - June-August; autumn - September-November. To evaluate INR variation, we determined; (1) average seasonal values, (2) percentage of values >3.0, and (3) percentage of clinic visits which required warfarin dose changes.

Results: We collected 1,434 INRs in a cohort of predominantly male (65%) and African American (84%) patients; mean age 57 years and average follow-up time 924 days. Mean INRs were highest in autumn (2.680.04) and winter (2.640.04) and lowest in spring (2.540.04) and summer (2.540.03); P<0.05 for autumn versus spring and summer. In autumn, 26% of visits had INRs >3.0; higher than the other seasons (winter=12%, spring=15%, summer=17%; P<0.04). In addition, more autumn clinic visits required dose changes (18%) than other seasons (all=12%; P<0.04).

Conclusions: We confirmed the occurrence and seasonal pattern of INR variation. Moreover, we extended prior European studies and not only report INR variation in American patients, but also that above target-range INRs occurred most frequently in the autumn, subsequently leading to more required dose changes. Although the mechanism remains unknown, our findings indicate that anticoagulation management could be modified to take seasonal variation into account and thereby reduce its impact on clinic workload.

Learning Objectives:

Explain how seasonal variation in INR may be an important risk factor for hemorrhagic or thrombotic complications

State how medication treatment, in response to seasonal variation in INR, should be tailored to optimize therapeutic outcome

Self Assessment Questions:

1)Which of these is/are true? Seasonal variation in warfarin:
a. may be an important risk factor in thrombotic complications
b. may be an important risk factor in hemorrhagic complications
c. causes increased INR values in the spring and summer
d. Two of the above are true
e. None of the above are true

True/False: According to the two European studies (Manotti et al. and Salobir et al.), higher INR values occurred in the autumn and lower INR values occurred in the summer.

DEVELOPMENT OF A STANDARDIZED ELECTROLYTE REPLACEMENT PROTOCOL

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Purpose: Electrolyte deficiencies are common in hospitalized and critically ill patients, and if not supplemented appropriately, can lead to symptoms that range from mild to life-threatening. Froedtert Hospital, a 500-bed academic medical center, does not currently have a standardized method for electrolyte replacement. Pharmacists often receive electrolyte replacement orders for inappropriate doses, routes, and formulations, and as a result, patients may not receive adequate or timely supplementation. The objective of this project is to develop and implement a standardized electrolyte replacement protocol in order to provide safe and effective therapy.

Methods: A one month retrospective review of the prescribing practice for potassium, magnesium, and phosphorous replacement was performed to assess the efficacy of electrolyte replacement at achieving normal serum concentration, the magnitude of response after replacement, the timeliness of replacement, and the use of intravenous and oral potassium chloride products. A survey was conducted to assess electrolyte management at similar academic institutions. The final protocol will be based on recommendations from current evidence-based literature, a review of replacement scales used at other institutions, and input from physicians. This will be presented to all services for feedback and suggestions before presentation to the Critical Care Committee, Med Safety Committee, and PNT committee for final recommendations and approval.

Preliminary Results/Conclusions:
Results from the retrospective review showed that electrolyte replacement achieved normal serum concentration greater than 50% of the time; however, the average ending concentration was just slightly above the lower end of normal for each electrolyte. Timeliness of replacement varied, and intravenous potassium chloride products were used more often than oral products. Similar academic institutions have implemented replacement protocols for different patient populations and all protocols contained exclusion criteria. Implementation of an electrolyte replacement order set or guideline is currently in process with results to be presented at the conference.

Learning Objectives:

List the advantages and disadvantages to implementing a standardized electrolyte replacement protocol.

Recognize the importance of ordering appropriate intravenous electrolyte formulations with administration at an appropriate rate.

Self Assessment Questions:

T/F: It is appropriate to order a nurse-driven electrolyte replacement protocol for all patients.

T/F: The recommended maximum rate of administration for potassium chloride via peripheral line is 20 meq/hr.

ACHIEVEMENT OF TARGET HEMOGLOBIN A1C IN VETERAN PATIENTS PRESCRIBED PIOGLITAZONE

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PURPOSE

The Veterans Affairs (VA) Pharmacy Benefits Manager (PBM) established national criteria-for-use to help guide prescribing of the non-formulary oral antidiabetic agent pioglitazone. Pioglitazone is reserved for patients inadequately controlled on formulary alternatives. Also, goal hemoglobin A1c (HgbA1c) should be attainable based on clinical trial data prior to initiation of pioglitazone. In prospective studies, pioglitazone demonstrated mean decreases in HgbA1c of 0.69% to 1.6%. The primary objective is to determine what percent of patients prescribed pioglitazone demonstrated significant decrease in HgbA1c at follow-up. A secondary objective is to evaluate what percent of patients with concurrent insulin therapy demonstrated significant decrease in insulin dose at follow-up.

METHODS

Data collection will be obtained through retrospective chart review of Cincinnati VAMC patients. A computerized search will provide the study population who received any pioglitazone from January 2007 through January 2009. Patients without adequate baseline and/or follow-up HgbA1c will be excluded. Data collection will include age, weight, HgbA1c, insulin dose, and pioglitazone dose, which will be collected at baseline (prior to pioglitazone initiation) and follow-up. Following collection, patients will be categorized as having shown significant decrease in HgbA1c or not. Significant decrease will be defined as ≥ 1% decrease (or reaching HgbA1c < 7%). Follow-up will be defined as HgbA1c obtained 3-13 months after pioglitazone initiation. For evaluation of the secondary endpoint, the subset of patients receiving insulin will be categorized as having had significant decrease in insulin dose at follow-up or not. Significant decrease in insulin dose will be defined as ≥ 20% decrease.

RESULTS/CONCLUSION

Data collection and analysis are currently ongoing. Results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference. The results of the study will be used to modify prescribing and renewal of pioglitazone in order for patients to receive maximum benefit from their diabetic regimens.

Learning Objectives:

Describe the potential adverse reactions associated with pioglitazone therapy.

Recognize the impact pioglitazone has on HgbA1c and total daily insulin dose in veteran patients.

Self Assessment Questions:

1. Pioglitazone carries a U.S. Boxed Warning for which of the following adverse reactions:
a.Liver Failure
b.Heart Failure
c.Respiratory Failure
d.Renal Failure

True/False: Based on prospective studies, one could typically expect a 2.5% decrease in HgbA1c following pioglitazone initiation.

IMPACT OF A PHARMACY-DRIVEN ANTIMICROBIAL STEWARDSHIP PROGRAM IN INTENSIVE CARE UNITS

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Purpose: The purpose of this project is to determine the utility of a pharmacist-run antimicrobial stewardship program at Sparrow Hospital in the intensive care units.

Methods: This before-after study will evaluate the impact of a pharmacist-driven antimicrobial stewardship program in all adult intensive care units (ICU) at Sparrow Hospital. Demographic information along with pertinent information involving the patients infectious disease(s), antimicrobial therapy, ability to take oral medications, and renal function will be obtained retrospectively on any patients in the ICU who had a positive culture reported by the Microbiology Department from August 1, 2009 to November 31, 2009. Beginning December 1, 2009, a prospective chart review will occur of patients with a reported positive culture to obtain demographic information and evaluate the patients antimicrobial regimen. When recommendations for maximizing antimicrobial therapy are determined, a pharmacist recommendation form will be placed in the chart in addition to verbal communication with the prescribing physician. The efficacy of this program will be measured by the change in inappropriate defined daily doses (IDDD) as calculated by the World Health Organizations ATC/DDD system which standardizes drug consumption across drug classes. For this study, IDDD calculations will include inappropriate duration of therapy, failure to narrow antimicrobial coverage when possible, inappropriate dosing of the antimicrobial based upon renal function, and failure to switch to oral therapy when possible. Efficacy will also be measured by the time between positive culture and appropriate antimicrobial selection.

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

Learning Objectives:

Describe components of a pharmacy-driven antimicrobial stewardship program that limit inappropriate antimicrobial usage.

Define outcome measures that determine the efficacy of an antimicrobial stewardship program.

Self Assessment Questions:

1.)What is the estimated rate of inappropriate antimicrobial usage in United States hospitals?

An infectious disease pharmacist should be at the core of any antimicrobial stewardship program.

TIME-SENSITIVE COMPARISON OF PULMONARY BACTERIAL FLORA BETWEEN CRITICALLY ILL TRAUMA, GENERAL SURGICAL, AND MEDICAL PATIENTS UNDERGOING BRONCHOALVEOLAR LAVAGE. THE TIME-MACHINE STUDY

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A delicate balance exists between initiating adequate empiric antibiotic therapy for ventilator-associated pneumonia (VAP) and overuse of broad-spectrum antibiotics. Strategies to qualify the need for broad-spectrum empiric antibiotic therapy are broad and often not specific for at-risk populations. Guidelines recommend that empiric antibiotic selections for VAP be based on time from hospital admission to VAP and patient-specific risk factors for multidrug-resistant (MDR) pathogens.

Baseline characteristics tend to differ between critically ill trauma, general surgical, and medical patients limiting the general applicability of a single set of empiric antibiotic therapy recommendations for VAP. Showing a difference in flora and associated time-sensitive changes between these groups of patients will provide useful information for the local VAP-related processes of care and provoke larger, perhaps prospective, studies to objectively differentiate empiric antibiotic therapy choices. Overall, this information will provide an opportunity to steward more effective and efficient population-specific organism coverage and reduce the progression of resistance by appropriately reserving broad-spectrum antibiotic use.

This is a retrospective, observational cohort study. Adult patients admitted to the surgical intensive care unit (ICU) or medical ICU at The University Hospital (TUH) between December 2006 and March 2009 having a bronchoalveolar lavage culture with greater than 10,000 colony-forming units (CFU)/mL will be included. Primary outcome measures are pathogen frequencies among general surgical, trauma, and medical ICU patients, time-sensitive pathogen frequencies and distributions among and between ICU and patient groups, changes in early versus late pathogen distributions utilizing time-sensitive cumulative percent comparisons of patients who develop late pathogens, probability of various formulary antibiotic regimens to result in adequate antibiotic therapy based on TUH antibiotic susceptibilities, and comparison of patient-specific and severity of disease characteristics for patients with late pathogens isolated within early time periods.

This study is currently undergoing data collection. Results and conclusions will be presented at the conference.

Learning Objectives:

Identify strategies used to improve outcomes for patients with ventilator-associated pneumonia.

Recognize the importance of implementing protocols to treat patients with ventilator-associated pneumonia.

Self Assessment Questions:

List 2 strategies in treating patients with ventilator-associated pneumonia to improve morbidity and mortality.

List 2 outcomes that have shown to be improved with the implementation of ventilator-associated pneumonia management protocols.

IMPLEMENTATION AND EVALUATION OF PHARMACY SERVICES TO A PALLIATIVE CARE PROGRAM

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Purpose:
According to the Center to Advance Palliative Care (CAPC), approximately 6 million people in the United States are potential candidates for palliative care. Because of this, palliative care programs are increasing in number. There was a 96% increase of palliative care programs from 2000 to 2006. Palliative care focuses on maximizing a patients quality of life. The optimization of quality of life is oftentimes accomplished through medication management of symptoms. For this reason, there is a role for pharmacy services in palliative care. The American Society of Health System Pharmacists (ASHP) has released a position statement recommending the role pharmacists should play in hospice and palliative care. Although ASHP has stated the role of pharmacy services in palliative care practice, there is still limited information from existing inpatient palliative care programs addressing the pharmacists role. Information on the implementation of pharmacy services in inpatient palliative care units is warranted. NorthShore University HealthSystem (NorthShore) has recently opened a 10-bed inpatient palliative care unit. The objective of this project is to implement and evaluate comprehensive pharmacy services to a palliative care program for both inpatient and outpatient groups served by NorthShore locations.

Methods:
A core pharmacy group was established to oversee the implementation of the project. These pharmacists will participate on the corporate multidisciplinary team to coordinate palliative care services. The necessary medication management and distribution systems will be identified and put into place. In addition, education and training will be provided to the pharmacy, nursing, and medical staff. A retrospective chart review will be performed to evaluate the symptom management on the palliative care unit. The nurses and physicians will also be surveyed to measure the satisfaction with the pharmacy services.

Results/Conclusion:
Analysis of results is ongoing. Results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Describe two key pharmacy services necessary when establishing a palliative care unit.

Identify three symptoms that pharmacists should monitor for in palliative care patients.

Self Assessment Questions:

True or False: Palliative care and hospice are interchangeable terms.

True or False: In the ASHP position statement on the role of pharmacy services in palliative care, the pharmacist should provide medication education only to the patient.

AN EVALUATION OF THE EFFICACY AND SAFETY OF PALIFERMIN TO REDUCE MUCOSITIS IN ALLOGENEIC STEM CELL TRANSPLANT PATIENTS

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Purpose: To compare the incidence of severe mucositis in allogeneic stem cell transplant (SCT) patients receiving palifermin versus standard care.

Methods: This study will be conducted as a retrospective, non-interventional chart review. Patients ≥ 18 years of age that received an allogeneic SCT with a treatment regimen containing myeloablative total body irradiation and/or methotrexate will be included. Patients previously enrolled in trials utilizing keratinocyte growth factors will be excluded. The primary endpoint to be evaluated is incidence of severe mucositis. Secondary endpoints to be evaluated include: utilization of intravenous/transdermal narcotic analgesia and total parenteral nutrition, incidence and duration of neutropenia and bacteremia, length of stay, and economic impact of palifermin. Adverse events consisting of rash, taste disturbances, and mouth changes will also be recorded. The primary objective will be evaluated using Fishers exact test and a multivariate Cox regression model. Secondary objectives will be evaluated using T-tests, Fishers exact tests, and descriptive statistics.

Results: Data collection is currently ongoing for this project. Results and conclusions are to be presented at the Great Lakes Pharmacy Resident Conference.e.

Learning Objectives:

Explain the pathophysiology of mucositis.

Describe the impact of palifermin (Kepivance) on mucositis in stem cell transplant patients.

Self Assessment Questions:

Which event(s) are responsible for the initiation phase of mucositis?
a.Chemotherapy
b.Bacteria
c.Cytokine release
d.Radiation
e.a and d

How does palifermin affect mucositis?
a.Prevents bacterial replication
b.Reduce the severity of mucositis
c.Reduce the incidence of mucositis
d.b and c
e.All of the above

EVALUATION OF THE INCIDENCE OF NEPHROTOXICITY ASSOCIATED WITH INTERMITTENT VERSUS CONTINUOUS INFUSION NAFCILLIN IN THE TREATMENT OF METHICILLIN-SENSITIVE STAPHYLOCOCCUS AUREUS (MSSA) BACTEREMIA

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Purpose

Nafcillin, a semisynthetic penicillin, is used in the treatment of methicillin-sensitive Staphylococcus aureus (MSSA) bacteremia. Traditionally, nafcillin has been administered over 30 minutes every four to six hours. However, continuous infusion of beta-lactam antibiotics has been utilized to optimize the time-dependent antibacterial effect. This strategy has been shown to be effective in maximizing the pharmacodynamic activity. In July 2008, The Ohio State University Medical Center (OSUMC) implemented continuous infusion nafcillin for the treatment of MSSA bacteremia. After implementation, clinicians observed cases of nephrotoxicity, including interstitial nephritis, with continuous infusion nafcillin. The objective of this study is to compare the incidence of interstitial nephritis associated with intermittent versus continuous infusion nafcillin.

Methods

A retrospective study was conducted to evaluate the incidence of nephrotoxicity associated with intermittent infusion nafcillin compared to continuous infusion nafcillin in the treatment of MSSA bacteremia. Patients were evaluated from June 1, 2007 to August 31, 2009. Patients between 18-89 years of age, excluding prisoners were included in the analysis. Data collected included: gender, age, co-morbidities, length of hospital stay, treatment with intermittent or continuous infusion nafcillin, nafcillin dose, duration of antibiotic therapy, SCr, BUN, urine output, urine eosinophils, peripheral eosinophil count, urinalysis, presence of fever, presence and description of rash, concomitant renal toxic medications or dyes, results of kidney biopsy, serum IgE, and use and type of dialysis.

Results and Conclusions

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

Learning Objectives:

Understand appropriate treatment of MSSA bacteremia

Understand the pharmacodynamic rationale for the administration of continuous administration of IV antibiotics

Self Assessment Questions:

(T/F) Nafcillin exhibits time-dependent bactericidal effect

(T/F) Vancomycin is the antibiotic of choice for treatment of MSSA bacteremia in a non penicillin allergic patient

RISK FACTORS FOR MRSA BACTEREMIA WITH AN ELEVATED VANCOMYCIN MIC (>1 MG/L)

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Patients with methicillin-resistant Staphylococcus aureus (MRSA) bacteremia with strains that show elevated vancomycin minimum inhibitory concentrations (MIC>1 mcg/mL) have been shown to have worse outcomes with vancomycin therapy than those with vancomycin MICs ≤ 1 mcg/mL. Early recognition of patients harboring these isolates may lead to more optimal empiric therapy and improved patient outcomes. The objective of this study is to determine which patients are at risk for isolation of a MRSA bacteremia strain with an elevated vancomycin MIC. Prior to commencement, we received approval from the Wayne State University Institutional Review Board. The study design is a retrospective, case-control study. Initially we obtained a query of the microbiological database for all positive cultures for MRSA from adult patients (at least 18 years of age) during the 18 month study period (February 2008 through August 2009). Each isolate was then categorized into one of two groups: cases (MRSA + vancomycin MIC > 1) and controls (MRSA + vancomycin MIC </= 1). Exclusion criteria included duplicate isolates, and patients who develop an elevated MIC during the initial treatment. Risk factors analyzed included, but not limited to, age, sex, nursing home residence, location in hospital at time of isolation, previous ICU stay, presence of a catheter, use of total parenteral nutrition, hemodialysis, total length of hospital stay before isolation of organism, previous antibiotics exposures, previous vancomycin exposure (including duration, amount), APACHE II score, use of immunosuppressive therapy, and comorbidities. Identification for the presence of risk factors in patients took place through the review of patients electronic and paper medical records. The pharmacy database provided information regarding previous antibiotic exposure. The investigators will analyze all variables in bivariate analysis to determine potential risk factors. Those found significant in the bivariate analysis will be entered into the multivariate model to elucidate independent risk factors..

Learning Objectives:

Describe the outcomes in patients with MRSA bacteremia with elevated vancomycin MICs (>1 mg/L)

Define the risk factors associated with MRSA bacteremia with elevated vancomycin MICs

Self Assessment Questions:

What are the potential outcomes in a patient with MRSA bacteremia with elevated vancomycin MICs?

Which of the following are the risk factors identified from this study (select all correct answers)?

EVALUATION OF THE USE OF A WARFARIN INPATIENT TO OUTPATIENT TRANSITION TOOL

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Purpose

Warfarin, the mainstay of anticoagulation therapy in the United States, has a very narrow therapeutic index and many drug interactions. It is imperative that proper education and instructions related to warfarin use are completed prior to hospital discharge. Beaumont Hospital recently implemented the use of an Anticoagulation Discharge Form to comply with the 2009 Joint Commission National Patient Safety Goal (NPSG) 3E and promote safe anticoagulation use. The form is intended to improve patient education, increase communication between health care providers and patients, and standardize the discharge process with respect to anticoagulation therapy. The primary objectives of this study are to evaluate utilization of the Anticoagulation Discharge Form and assess patient understanding of warfarin education provided prior to hospital discharge.

Methods

Pharmacy Dosing Service records of hospitalized patients were collected daily to capture patients discharged on warfarin between November 1, 2009 and December 31, 2009. One hundred consecutive patients discharged from Beaumont Hospital-Royal Oak on warfarin during the study period were included. Patients were excluded if they were not available for contact within one week of discharge, denied the phone interview, were discharged to another health facility, or had a non-working phone number. Patients who met inclusion criteria were identified to evaluate completion of the Anticoagulation Discharge Form and contacted to complete a telephone interview within one week after discharge to assess patient understanding of warfarin management. Data collection included patient demographics, indication for warfarin, warfarin dose, target INR, length of anticoagulation, date of education, date of PT/INR, and follow-up provider. The phone interview consisted of 19 questions related to the warfarin educational content areas included in the Beaumont warfarin patient teaching materials.

Results

Final results with conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Recognize areas for improvement in the anticoagulation discharge process.

Identify areas for improvement in warfarin patient education.

Self Assessment Questions:

What is the purpose of the Joint Commission National Patient Safety Goal 3E?

a. Increase the number of patients discharged on low molecular weight heparin.

b. Reduce the likelihood of patient harm associated with use of anticoagulation therapy.

c. Reduce the number of hospital admissions for IV heparin therapy.

d. Standardize warfarin (Coumadin) doses for patients over 65 years of age.

When educating a patient on warfarin therapy, which of the following is an important point to address?

a.Food items that interfere with warfarin (Coumadin).

b.Activities to limit or avoid while taking warfarin (Coumadin).

c.Signs and symptoms of bleeding, deep vein thrombosis, pulmonary embolism, or stroke.

d.A and C

e.All of the above

CORTICOSTEROID DOSING AS A FUNCTION OF WEIGHT IN PATIENTS WITH ACUTE EXACERBATIONS REQUIRING MECHANICAL VENTILATION.

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Patients who present to the emergency department for acute exacerbations of asthma receive corticosteroid therapy as a mainstay of treatment; however, the optimal corticosteroid dose is controversial and dosing varies widely in patients with respiratory failure. Little is known about the effects of body weight on the efficacy and safety of corticosteroid therapy. The objective of this study is to determine optimal dosing of corticosteroids in asthma patients based on weight.

This retrospective chart review will utilize the health systems electronic and paper medical record system to identify adult patients who have been admitted with status asthmaticus requiring mechanical ventilation between January 2007 and September 2009. The primary outcome that this study will focus on is change in peak airway pressure. In addition, secondary outcomes will include duration of mechanical ventilation, airway resistance, arterial pH, incidence of hyperglycemia, prolonged immobility, and incidence of infection and gastrointestinal bleeding. The following demographic data will be collected: age, gender, weight, ethnicity, co-morbidities (lung diseases, chronic obstructive pulmonary disorder, diabetes mellitus, musculoskeletal disorders, hypertension, smoking), medications prior to admission (beta-agonists, corticosteroids, leukotriene receptor antagonists, and antihypertensives including beta-blockers), and baseline pulmonary function tests if available. Once data are collected, these variables will be analyzed to determine if a correlation exists between the daily corticosteroid dose normalized for weight and efficacy and safety outcomes.

Learning Objectives:

Describe the outcomes in patients treated for status asthmaticus and treated with corticosteroids based on their dose as a function of their weight (mg/kg).

Define the difference in patient outcomes with respect to their corticosteroid dose (mg/kg).

Self Assessment Questions:

The higher the corticosteroid dose (mg/kg), the greater the change in peak airway pressure at 48hrs after initiation.

Which of the following are associated with higher corticosteroid doses (mg/kg), as identified by this study? (circle all that apply)

EVALUATION OF SEDATION AND ANALGESIA PRACTICES IN MECHANICALLY VENTILATED PATIENTS

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Background: Critically ill patients often have pain, anxiety, and distress which may be caused by pre-existing conditions, procedures, trauma, and monitoring or therapeutic devices. Inadequate pain relief may lead to agitation and physiologic stress responses characterized by tachycardia, increased myocardial oxygen consumption, hypercoagulability, and immunosuppression. These conditions may prolong length of stay (LOS) in the intensive care unit (ICU) and presents a greater risk of acquiring nosocomial infections or medical complications. The importance of appropriate pain and sedation management has been reinforced by The Joint Commission (TJC) standards and associated critical care societies. The 2002 guidelines for sedative and analgesic use in critically ill patients recommend regular assessment, response, and titration of therapy based on predefined goals. Protocol driven sedation and analgesia management of ICU mechanically ventilated (MV) patients have demonstrated to reduce the duration of sedation, mechanical ventilation, ICU and hospital LOS.

Methods: This prospective, observational study will take place in the medical ICU at RUMC, a 613 bed academic medical center. The protocol was approved by the RUMC Investigational Review Board for human experimentation. Eligible patients were at least 18 years of age, mechanically ventilated, and admitted to the adult medical ICU. Data recorded for the study group includes patient age, gender, APACHE II score, illicit drug use, alcohol use, length of intubation prior to continuous sedation or analgesia, MV duration (days), type, total amount (mg/day), and rate of intravenous administration of sedative or analgesic administered, sedation holiday, spontaneous breathing trial, and SAS score. The primary endpoint is the duration of MV (days). The secondary endpoints include ICU length of stay (days), duration and quantity of sedation and analgesia. The data obtained will be used as a baseline comparator to evaluate endpoints after a change in sedation and analgesia practices implemented at RUMC for MV patients.

Summary: Research in progress

Learning Objectives:

Evaluate current practices in MV patients (ie, duration of MV days, ICU LOS and adverse drug events of analgesia/sedation) prior to implementation of the sedation and analgesia pathway in the adult medical ICU

Identify strategies to decrease MV days, ICU LOS for MV patients, and adverse drug events secondary to sedation/analgesia

Self Assessment Questions:

What are some complications of having a patient on prolonged MV?

What is a method to reduce a MV patients LOS in the ICU?

ASSESSMENT OF CLINICAL PHARMACIST MANAGEMENT OF LIPIDS, BLOOD PRESSURE, AND HEMOGLOBIN A1C IN A VA MEDICAL CENTER PRIMARY CARE SETTING

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PURPOSE: Cardiovascular disease is the leading cause of death in developed countries. Studies have shown that reducing cholesterol, lowering blood pressure, and controlling diabetes can significantly reduce morbidity and mortality associated with these diseases. In several studies, pharmacist-run primary care clinics have shown benefits in the management of hyperlipidemia, hypertension, and diabetes. The objective of this retrospective study is to assess the effectiveness of clinical pharmacist management of hyperlipidemia, hypertension and type 2 diabetes mellitus in the outpatient setting.

METHODS: This study is a retrospective chart review of patients who received treatment by clinical pharmacists from June 2009 until March 2010. All patients who participated in the pharmacy primary care clinics are included. Patients were excluded from the pharmacy primary care clinics if they refused care, disease states were managed by a non-VA provider, received dialysis, abused alcohol or illicit drugs, was non-adherent with treatment recommendations, or if the patients life expectancy is < 1 year. Data analyzed for this study included blood pressure, lipid profile, liver function tests, hemoglobin A1c, medications, age and gender. Descriptive statistics, such as percentage, median, mean, and standard deviation, will be used to evaluate the data. The primary objective is the percentage of patients who meet their respective disease state goal(s). The secondary objectives are the number of visits and the number of medications needed to obtain disease state goal(s). For the primary objective, the percentage of patients who meet their LDL, blood pressure, and HA1c goals will be calculated. For the secondary objective, the number of visits the patient had and the number of medications the patient was on to obtain his/her goal LDL, blood pressure, and HA1c values will be calculated.

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

Learning Objectives:

Recognize the role clinical pharmacists have on a patients lipid panel, blood pressure and hemoglobin A1c.

Discuss the benefits of clinical pharmacist involvement in the ambulatory care setting.

Self Assessment Questions:

True or False: Clinical pharmacists are effectively able to help patients get to their respective disease state goal(s).

True or False: Clinical pharmacist involvement in the ambulatory care setting resulted in an increased number of medications prescribed to get patients to their respective disease state goal(s).

EFFECT OF PHARMACY-LED EDUCATIONAL INTERVENTION ON THE APPROPRIATE USE OF HALOPERIDOL FOR THE TREATMENT OF DELIRIUM IN THE MICU

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PURPOSE: It is estimated that over 80% of intensive care unit patients develop delirium. The preferred agent for the treatment of delirium in critically ill patients is haloperidol. This agent is rarely used in the medical intensive care unit (MICU) at our institution. We sought to evaluate the utilization and safety of haloperidol use in our MICU before and after a pharmacy-led educational program.

METHODS: A prospective, education intervention study was conducted of adults admitted to the MICU from November 2009 to February 2010. Patients were excluded if they were not managed by the primary MICU team or received haloperidol as a home medication prior to admission. The study comprised three periods: (i) a one month pre-intervention observation period during November 2009; (ii) an education-alone period from December 2009 to January 2010; and (iii) an education plus observation period from January 2010 to February 2010. Patient data from periods (i) and (iii) were compared and analyzed for haloperidol utilization and adherence to hospital guidelines.

RESULTS: Data collection and statistical analysis will be completed by March 2009. Final results with conclusion will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Recognize outcomes associated with delirium

Identify appropriate monitoring for haloperidol

Self Assessment Questions:

Which of the following outcomes is/are NOT associated with delirium?
a.Increased mortality
b.Increased quality of life (QOL)
c.Decreased length of stay
d.Increased cost of hospitalization
e.More than one of the above

BB is a 55 yom that was admitted the medical intensive care unit (MICU) for pneumonia with severe hypoxia. The patient was intubated and started on antibiotics, sedatives, and analgesics. After the patient was extubated, BBs relatives noted that the patient no longer recognized them. After determining that BB was not in pain and was at the goal level of sedation, the physician diagnosed the patient as delirious and started haloperidol IV per protocol. Which of the following is/are appropriate monitoring of haloperidol in BB?
a.Serum creatinine
b.Pulmonary function tests
c.Electrocardiogram
d.Creatine phosphokinase
e.More than one of the above

IATROGENIC QTC PROLONGATION: INCIDENCE AND RISK FACTORS IN THE CRITICALLY ILL

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PURPOSE: Critically ill patients often have several risk factors for QTc prolongation and are prescribed medications which prolong the QT interval, increasing the risk of torsades de pointes (TdP). It is beneficial to monitor the QT interval and correct any modifiable, iatrogenic risk factors. Our purpose was to determine the incidence of QTc prolongation in the critically ill and to identify risk factors associated with QTc prolongation.

METHODS: This retrospective cohort study included patients admitted to the ICU in June 2009. Patients were excluded if they were <18 years old, stayed <24 hours in the ICU, or had insufficient EKG data. All available EKGs collected during the ICU stay were measured to find the longest QT interval using the II and V leads and were corrected for heart rate with the Bazett formula to obtain the QTc. Iatrogenic QTc prolongation was defined as QTc >450 ms for males, >470 ms for females, or >60 ms increase from baseline for patients with baseline QTc prolongation. Demographics, established risk factors, and potential new risk factors were collected. All medications having a possible risk of QTc prolongation/TdP and factors altering drug metabolism were recorded.

RESULTS: One hundred patients were evaluated (57% MICU, 43% SICU). 57% had ≥1 prolonged QTc in the ICU, although 27% had a prolonged QTc at baseline. 32% had iatrogenic QTc prolongation, none resulting in TdP. Upon univariate analysis, patients with iatrogenic QTc prolongation were more likely to have hypokalemia, mechanical ventilation, and longer length of stay. 66% were prescribed a QTc prolonging medication; however, medication-associated factors including PK/PD drug interactions were not significantly different between groups.

CONCLUSIONS: While QTc prolongation was common in the ICU, QTc prolonging medications did not make a clinically important impact in its prevalence and response to QTc prolongation should be individualized.

Learning Objectives:

Describe the common drug classes associated with QTc prolongation.

List three established risk factors for QTc prolongation.

Self Assessment Questions:

Which antiarrhythmic medication is NOT associated with QTc prolongation?
a.Amiodarone
b.Dronedarone
c.Flecainide
d.Lidocaine

Which of the following is NOT an established risk factor for QTc prolongation?
a.Female gender
b.Alzheimers disease
c.Cardiovascular disease
d.Electrolyte depletion

IMPACT OF ROSUVASTATIN ON LDL CHOLESTEROL IN A VETERAN POPULATION PREVIOUSLY TREATED WITH EZETIMIBE/SIMVASTATIN: A RETROSPECTIVE STUDY

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Purpose: Elevated low density lipoprotein cholesterol (LDL-C) is linked to increased cardiovascular and cerebrovascular morbidity and mortality. The initial treatment of choice remains monotherapy with a statin. The purpose of this study is to evaluate the safety and efficacy of converting patients on ezetimibe/simvastatin to rosuvastatin. To date, studies comparing the LDL-C lowering effect of rosuvastatin in people who were previously controlled on simvastatin/ezetimibe are lacking. During 2008-2009, patients taking ezetimibe/simvastatin (Vytorin) were converted to rosuvastatin after new literature was published and the Department of Veterans Affairs (VA) made rosuvastatin the preferred high potency, nonformulary statin. The study will focus on patients who were at LDL-C goal on ezetimibe/simvastatin 10/80 mg (Vytorin) and were then changed to either rosuvastatin 20 mg or 40 mg.

Methods: This study is a retrospective, electronic medical record review of patients within the Jesse Brown VA Medical Center (JBVAMC) on ezetimibe/simvastatin 10/80 mg daily with LDL-C at goal and who were converted to either rosuvastatin 20 mg or 40 mg daily. The primary endpoints are the number of patients who maintained LDL-C goal after conversion and change in LDL-C. Secondary endpoints are: change in total cholesterol, high-density lipoprotein cholesterol, triglycerides, total adverse events, alanine aminotransferase elevation, and additional lipid lowering drugs required after conversion. Subjects included in the study are patients 18 years of age and older who received their medication at JBVAMC, had pertinent labs on file, and achieved goal LDL-C prior to conversion. Patients receiving concurrent lipid lowering medications or lipid lowering agents from a pharmacy other than JBVAMC will be excluded from the study. Other exclusion criteria are previously recorded allergy/adverse drug reaction to rosuvastatin and concurrent administration of medications that interact with rosuvastatin.

Learning Objectives:

Recognize the role of stain therapy in the primary and secondary prevention of coronary heart disease

Identify the LDL-C lowering potential of ezetimibe/simvastatin 10/80 mg, rosuvastatin 20 mg and rosuvastatin 40 mg

Self Assessment Questions:

According to NCEP-ATP III guidelines, what is the LDL-C goal for people with known coronary heart disease and diabetes?

True or False: The combination of ezetimibe and simvastatin has been shown to have incremental benefit on cardiovascular morbidity and mortality over and above simvastatin monotherapy

THE EFFECTS OF IMPLEMENTING COMPUTERIZED PROVIDER ORDER ENTRY IN PERIOPERATIVE AREAS ON MEDICATION ORDER VOLUMES AND MEDICATION TURN-AROUND TIME

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Purpose:
There are several studies that have demonstrated a reduction in medication Turn-Around Time (TAT) following the implementation of Computerized Provider Order Entry (CPOE). While several studies have demonstrated a decrease in medication TAT for general inpatient units, the effect of CPOE on medication TAT for patients in perioperative areas has not been elucidated. Additionally, there is a lack of data on the effect that CPOE has on the overall number of medication orders prospectively reviewed by a pharmacist. The primary objectives of this study were to assess medication TAT and medication order volume for orders placed for patients in perioperative areas.

Methods:
Medication orders that were placed for patients while they were in perioperative areas (Adult or Pediatric Operating Room (OR), the Outpatient OR, or Gastrointestinal (GI) procedure area) were included in the analysis of order volume. The TAT of all epidural infusions administered in perioperative areas was measured before and after the implementation of CPOE. Prior to the implementation of CPOE, the times the order for an epidural infusion was transcribed and verified were obtained from the pharmacy information system and the time the order was administered was obtained from the paper anesthesia record. After the implementation of CPOE, all of the above data were obtained from the Electronic Medical Record (EMR). Prior to the implementation of CPOE, order volume data were obtained from paper orders sent to the central pharmacy as well as from the pharmacy information system. After the implementation of CPOE, data were obtained from the EMR.

Results/Conclusion:
Analysis of results is ongoing. Results and conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:

Describe how the implementation of CPOE affects the medication use process.

Describe the effect CPOE has on medication orders volume and medication turn-around time in perioperative areas.

Self Assessment Questions:

True/False: The decreased medication TAT associated with CPOE is primarily due to reduced time spent preparing medications.

The implementation of CPOE eliminates which of the following phases of the medication use process?
a.Prescribing
b.Transcribing
c.Dispensing
d.Administering
e.Documenting

COMPARATIVE ANALYSIS OF VANCOMYCIN-ASSOCIATED NEPHROTOXICITY BEFORE AND AFTER IMPLEMENTATION OF NEW DOSING GUIDELINES

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PURPOSE: The American Society of Health-System Pharmacists (ASHP), in collaboration with the Infectious Diseases Society of America (IDSA), and the Society of Infectious Diseases Pharmacists (SIDP) published the first consensus guidelines for vancomycin in 2009. The new guidelines recommend a loading dose, followed by maintenance doses based on actual body weight with no maximum dosage stated. Community Health Network elected to change their dosing protocol to more closely parallel the new dosing guidelines. The primary objective of this study is to compare the incidence of nephrotoxicity before and after new guideline implementation at Community Health Network to ensure optimal dosing without sacrificing safety.

METHODS: A retrospective chart review will be conducted of hospitalized patients between the ages of 18 and 89 who received vancomycin therapy for at least 48 hours from January 1, 2009 through February 28, 2010. Patients will be excluded if they received peritoneal or hemodialysis, had documented acute renal failure (serum creatinine ≥ 2 mg/dL) prior to receiving vancomycin, received contrast dye in the seven days prior to initiation of vancomycin therapy, received concomitant vasopressors, or have a history of cystic fibrosis. Eligible patients will be divided into pre and post-guideline implementation cohorts and will be matched in a 1:1 ratio based on gender and age plus or minus 5 years. The following data will be collected: baseline demographics, loading dose, maintenance dose, frequency, initial trough concentration, time to therapeutic trough, duration of therapy, baseline serum creatinine (SCr) and highest SCr, concomitant nephrotoxic drugs, maximum temperature, white blood cell count (WBC), positive cultures, etc. Descriptive statistics will be used to analyze the data collected.

RESULTS AND CONCLUSION: To be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Discuss the history of vancomycin toxicity and associated risk factors.

Compare and contrast previous peak and trough vancomycin concentrations and monitoring parameters to current recommendations.

Self Assessment Questions:

Which of the following is the minimum trough concentration needed to generate an AUC:MIC = 400?
a.5 mg/L
b.10 mg/L
c.15 mg/L
d.20 mg/L
e.b and c

True or False: According to the 2009 vancomycin consensus guidelines vancomycin trough concentrations are the most accurate and practical method for monitoring efficacy.

PREDICTORS OF NOSOCOMIAL INFECTION IN PATIENTS WITH VENTRICULAR-ASSIST DEVICES

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Purpose: Infections occur in 18-59% of patients with ventricular-assist devices (VADs) and are associated with significant morbidity and mortality. Risk factors for nosocomial infection in patients with VADs have not been described in previous studies. Identifying modifiable risk factors for infection in patients with VADs may lead to improved outcomes. Therefore, the primary objective of this study is to identify predictors of nosocomial infections in patients with VADs. The secondary objectives of this study are to characterize the epidemiology of VAD-related infections, characterize the effects of all nosocomial infection and VAD-related infection on outcomes (including explantation, transplantation, death), and to determine the cost associated with these infections.

Methods: Patients at Henry Ford Hospital who received a VAD were included in the study. Data was collected via retrospective chart review. Data collected includes baseline characteristics of patients prior to implantation, site of infection(s), pathogen(s) isolated, treatment course, infection outcome, length of stay, and time to patient outcome (explantation, transplantation, death). Univariate odds ratios and bivariate analysis will be utilized. Multivariate analysis will be completed for developing predictive models of risk. Survival analysis will be completed for construction of Kaplan meier curves.

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

Learning Objectives:

Given a patient with a VAD-related infection be able to choose an empiric antimicrobial regimen based on the likely pathogens.

Explain the impact of VAD-related infections on clinical outcomes.

Self Assessment Questions:

Which of the following pathogens is/are common in VAD-related infections?
A. S. aureus
B. S. epidermidis
C. enterococci
D. All of the above

True/False: VAD-related infections are associated with significant morbidity and mortality.

APPROPRIATENESS OF THROMBOPHILIA SCREENING IN PATIENTS WITH PROTEIN C OR S DEFICIENCY ON ORAL ANTICOAGULATION

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Purpose:
A thrombophilic state occurs when the balance of the coagulation cascade is tipped toward thrombosis. Risk of initial and recurrent venous thromboembolism may be increased in patients with thrombophilic states such as protein C or S deficiency. Many of these patients may be recommended for an indefinite duration of oral anticoagulation with warfarin. If presence of a thrombophilic state is taken into consideration when determining duration of oral anticoagulation therapy, it is vital to ensure that the screening processes are correctly utilized to ensure appropriate documentation of protein C and/or S deficiency. This study was designed to evaluate the appropriateness of screening for protein C and/or S deficiency in patients referred to the Pharmacy Anticoagulation Service (PAS) at The University Hospital for management of oral anticoagulation.

Methods:
This is an investigator-initiated, single-center, retrospective study conducted at The University Hospital in Cincinnati, Ohio. Patients referred to the PAS for management of oral anticoagulation will be screened for documentation of protein C and/or S deficiency within the electronic medical record, other past medical records, or in referral documents provided to the PAS. Subjects with documented protein C and/or S deficiency will be included and evaluated for the appropriateness of screening tests performed. Evaluations of thromboembolic events and bleeding as well as bridging events over the preceding 18 months will also be reported.

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

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

Learning Objectives:

Explain the rationale for evaluating appropriateness of screening tests for protein C and S deficiencies.

Evaluate appropriateness of screening tests for protein C and S deficiencies in relation to both type and timing of screening tests.

Self Assessment Questions:

Which of the following is an appropriate screening test for protein C deficiency if a patient remains on stable oral anticoagulation?
a. Protein C antigen/factor VII antigen ratio
b. Protein C functional assay
c. Protein C antigen
d. Any of the above may be used to screen for protein C deficiency in this patient

Which of the following may deplete endogenous levels of protein C and/or S?
a. Acute venous thromboembolism
b. Oral anticoagulation with warfarin
c. Vitamin K deficiency
d. All of the above

ASSESSMENT OF A MEDICATION-ORDERING TEMPLATE ON THE MONITORING OF METABOLIC SYNDROME IN PATIENTS PRESCRIBED ATYPICAL ANTIPSYCHOTIC MEDICATIONS

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Purpose: A recent consensus guideline provides recommendations on the appropriate monitoring of patients receiving atypical antipsychotics for the development of weight gain, dyslipidemia, and diabetes. The primary objective of this study is to assess if the implementation of a medication-ordering template improves the monitoring of patients prescribed atypical antipsychotics for abnormalities in fasting lipids, blood pressure, plasma glucose and body mass index. Secondary outcomes will assess if more patients receive medication treatment for dyslipidemia, diabetes, and hypertension and if more patients stay at or below their low-density lipoprotein, blood pressure, plasma glucose, and body mass index goals after the implementation of the medication-ordering template.

Methods: The electronic medical record will be used to retrospectively identify 100 charts of psychiatric outpatients prescribed atypical antipsychotic medications at total daily doses typical for the treatment of psychosis (risperidone > 2 mg, quetiapine > 200 mg, ziprasidone > 40 mg, olanzapine > 5 mg, clozapine > 150 mg, aripiprazole > 10 mg) prior to the implementation of a medication-ordering template. This retrospective review will assess if these patients had baseline and follow up monitoring performed in accordance with the consensus guidelines. An additional 100 psychiatric patient charts will be reviewed to assess patients that have been prescribed atypical antipsychotic medications at doses typical for the treatment of psychosis following the implementation of a medication-ordering template. The medication-ordering template will be designed to alert providers to a patient's most recent weight and fasting lipid, blood pressure and plasma glucose labs when ordering an atypical antipsychotic medication. Additionally, the template will provide physicians the opportunity to order follow-up labs to monitor patients at the time intervals recommended by the consensus guidelines.

Results: Approved by IRB. The results and conclusions of this study will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

List the recommended monitoring parameters for patients prescribed atypical antipsychotic medications stated in the 2004 consensus development conference on antipsychotic drugs and obesity and diabetes.

Place in order the following atypical antipsychotic medications from the most likely to the least likely to cause metabolic abnormalities: aripiprazole, clozapine, olanzapine, quetiapine, risperidone, ziprasidone.

Self Assessment Questions:

1) Which of the following medications is most likely to result in metabolic abnormalities?
A. quetiapine
B. aripiprazole
C. olanzapine
D. ziprasidone

2) Which of the following monitoring parameters is paired with its correct monitoring frequency as recommended in the 2004 consensus development conference on antipsychotic drugs and obesity and diabetes?
A. Weight: baseline, 4 weeks, 10 weeks, quarterly
B. Blood pressure: baseline, 12 weeks, annually
C. Fasting plasma glucose: baseline, 8 weeks, annually
D. Fasting lipid profile: baseline, 12 weeks, quarterly

IDENTIFICATION OF DRUG THERAPY PROBLEMS THROUGH MEDICATION RECONCILIATION IN HEART FAILURE PATIENTS IN AN AMBULATORY OUTPATIENT CLINIC: A QUALITY IMPROVEMENT INITIATIVE

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Purpose:
Research has suggested medication list accuracy is a significant problem. A number of studies have explored the role of pharmacists in medication reconciliation, suggesting pharmacists who provide pharmaceutical care are uniquely qualified to improve medication safety. Because many prescriptions are prescribed in an ambulatory care setting, accurate medication records can be utilized to identify and resolve drug therapy problems, ensuring safe and effective use of medication in patient care. However, studies that evaluate the role of pharmacists in drug therapy problem identification through medication reconciliation are limited in the outpatient setting. This study will evaluate the role of clinical pharmacists in drug therapy problem identification through medication reconciliation in an ambulatory heart failure clinic.

Method:
This is a prospective pilot study enrolling up to sixty patients who are at least 18 years of age, with a documented diagnosis of systolic or diastolic heart failure evaluated in the Heart Failure Center at Marshfield Clinic from October 2009 to April 2010. Patients who are non-English speaking, without an active medication on their electronic medication profile or are unable to provide a medication history will be excluded from this study. Pharmacists will obtain a medication history during patient interview on their initial visit to the Heart Failure Clinic. Medication discrepancies found between the patients reported list and the electronic medication list will be documented on a standardized form in the following categories: medication omission, recorded medication on electronic list but not taken by the patient, and dose/frequency discrepancy. Next, the pharmacist will evaluate the patients reconciled medication list to identify frequency and type of drug therapy problem related to indication, effectiveness, safety and adherence. Descriptive statistics will be utilized to evaluate the frequency and type of each outcome.

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

Learning Objectives:

Recognize the importance of medication reconciliation in the ambulatory care setting.

Describe the role of clinical pharmacists in identifying drug therapy problems through medication reconciliation.

Self Assessment Questions:

A medication list is defined as "complete" if the following information is captured for each individual medication on the patients medication list:
a. Name, dose, day supply, and frequency
b. Dose, name, route of administration and frequency
c. Name, dose, generic substitution, frequency

Which of the following is/are common drug therapy problem(s) found in patients medication list?
a. Drug-drug interactions
b. Inappropriate medication dose (dose is too high/low)
c. Patient nonadherance
d. All of the above

ASSESSING THE IMPACT OF SIMULATION TRAINING FOR PHARMACY RESIDENTS

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Background: Simulation-based training is an essential tool in the training of high-risk occupations such as airline pilots, astronauts, military personnel and nuclear power plant technicians. Recently, simulation has been incorporated in the training of healthcare professionals, including emergency medicine, radiology, pediatrics and trauma.1,2 Although simulation training has been utilized in the medical and nursing fields, limited literature exists regarding its use within the practice of pharmacy.

Objective: The aim of this study is to assess the impact of simulation training versus didactic lecturing on pharmacy residents knowledge of the efficacy and safety of intravenous medications.

Methodology: Pharmacy practice and specialty residents from local area institutions will be included in this study. Prior to initiation of the study, residents will be advised to complete an online exam that will serve as a baseline assessment of their knowledge. Upon initiation of the study, residents will be randomized to receive a didactic lecture or simulation training on the topic of sedatives and analgesics. Following completion of the lecture or training, residents will convene for a post-test on sedatives and analgesics. The group that received the didactic lecture will then cross-over to the simulation lab to receive training on vasoactive agents, and vice versa. The groups will once again convene for a post-test on vasoactive agents. Three months after study completion, residents will be asked to complete an online post-test to assess knowledge retention following simulation training.
Data analysis will include: pre-test scores, post-test scores on both sedatives/analgesics and vasoactive agents, and resident evaluation of simulation training. Pre- and post-simulation scores will be assessed using a students t-test. Secondary end points will be analyzed using a chi-squared or Fischers exact test, where appropriate.

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

Learning Objectives:

Identify opportunities to incorporate simulation training within clinical pharmacy to improve medication safety

Demonstrate how simulation training can enhance active learning and retention of key clinical concepts

Self Assessment Questions:

Benefits of simulation training, as evidenced in the literature, include:
A. standardization and repetition of content
B. interactive learning in a clinical setting
C. the ability to design goal-directed clinical experiences
D. all of the above

True or False. Simulation training is a form of passive learning.

PROCALCITONIN AS A LABORATORY MARKER OF RESPONSE TO ANTIBIOTIC THERAPY: A PROSPECTIVE OBSERVATIONAL STUDY OF THE CORRELATION BETWEEN PROCALCITONIN LEVELS AND CLINICAL IMPROVEMENT

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The purpose of this study is to observe the change in procalcitonin levels in critically ill patients beginning treatment with IV antibiotic therapy for moderate to severe infections. The primary outcome will be to determine whether a change in procalcitonin within the first 72 hours of therapy correlates with clinical response to be assessed 10 days after the initiation of antibiotic therapy. The secondary outcome will be to compare procalcitonin decreases with other clinically accepted markers used to monitor response to antimicrobial therapy such as heart rate and other vital signs, WBC count, and eradication of pathogen. Our overall goal would be to provide a correlation between percentage decrease in procalcitonin and clinical success of antibiotic therapy.

This is a prospective observational study involving critically ill patients who are prescribed antibiotics to treat infection. Plasma from blood samples already drawn for routine clinical laboratory testing will be assayed for procalcitonin. If the initial procalcitonin level is elevated, a follow up measurement will be performed after 72 hours of antibiotic therapy. In these patients, the extent of decline in serum procalcitonin levels (percent decrease) will be calculated. The patients response to antimicrobial therapy will be assessed from the patient record 10 days following the initiation of therapy and the percent clinical response for patient groups stratified by serum procalcitonin changes will be compared. The study is expected to enroll up to fifty patients from the intensive care unit at Meriter Hospital.

Data collection for this study is ongoing. Preliminary results and conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:

To recognize the current and potential future uses of the procalcitonin lab assay.

To identify a link between procalcitonin response and antibiotic usage.

Self Assessment Questions:

Which one of the following statements best describes the role of procalcitonin in the human body?
A. Acute phase reactant
B. Biological waste product
C. Marker of chronic illness
D. Regulator of calcium homeostasis

Which statement best describes the typical role of the procalcitonin test in medical practice?
A. Determining antibiotic duration of therapy
B. Initial diagnosis of acute infection
C. Initial diagnosis of sub-acute infection
D. Stratifying patient mortality risk

ESTABLISHING PHARMACIST-MANAGED AMBULATORY CARE SERVICES WITHIN A CLINICAL CANCER CENTER

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Purpose: Cancer is the second leading cause of death in the United States and is responsible for more than 200 billion dollars in health-related costs each year. The Clinical Cancer Center at Froedtert Hospital provides individualized care to cancer patients to improve outcomes and manage health care costs. The Clinical Cancer Center offers thirteen disease specialized programs. The largest program is the Breast Care Center, which currently provides care to over 265 patients each week.

Historically, the pharmacists in the Clinical Cancer Center have primarily been involved in dispensing functions. However, the Breast Care Center offers a wide array of services to breast cancer patients, including individualized physician care, genetic counseling, dietitian support, social work assistance, and support groups. The objective of this project is to establish pharmacist-managed ambulatory care services in the Breast Care Center to improve patient outcomes, enhance patient and provider satisfaction, and provide cost savings.

Methods: A pharmacist was integrated into the existing workflow of the Breast Care Center. A baseline Breast Care Center provider survey was performed to evaluate providers opinions of development of pharmacist-managed ambulatory services. The pharmacist documented interventions performed for Breast Care Center patients, such as medication histories, chemotherapy dosing and administration, side effect management, drug interactions, patient and staff education, cost effectiveness, and transition to outpatient pharmacies. These interventions were tracked and categorized into three areas: treatment, supportive, or financial. A follow-up Breast Care Center provider and patient survey will be conducted to evaluate pharmacist-managed ambulatory services.

Results/Conclusions:
Research is in the collection phase. Final results and conclusion will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Discuss why the Breast Care Center at Froedtert Hospital was the pilot site for implementing pharmacist-managed ambulatory care services.

Identify the role of pharmacist-managed ambulatory care services within a cancer center.

Self Assessment Questions:

What is the most common type of intervention made by the ambulatory pharmacist in the Breast Care Center at Froedtert Hospital?
a.Treatment
b.Supportive
c.Financial

T / F Pharmacist-managed ambulatory care services can improve patient satisfaction?

EVALUATION OF THE ACID SUPPRESSION STEWARDSHIP PROGRAM IN NON-INTENSIVE CARE PATIENTS

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Purpose:
The primary purpose of this project is to evaluate the acid suppression stewardship program on the appropriate use of acid suppression therapies (i.e. proton pump inhibitors and histamine 2 receptor antagonists) in non-intensive care patients at the Clement J. Zablocki Veterans Affairs Medical Center. Rates of appropriate use will be compared utilizing pre- and post-stewardship program data.

Methods:
The study entailed a retrospective chart review of patients who were admitted or transferred to a non-intensive care unit and were prescribed acid suppression therapy. The following were considered appropriate uses of acid suppression therapy: treatment of upper GI bleed, protection from NSAID related ulcers, protection from high-dose corticosteroid use (greater than 250mg/day hydrocortisone or its equivalent), use in Helicobacter pylori eradication, treatment of new onset GERD, duodenal ulcer, Barrett's esophagus, erosive esophagitis or gastritis, and the continuation of an active outpatient acid suppression regimen. In order to be considered active for this study, the outpatient acid suppression therapy prescription has to have been filled or refilled within the previous 90 days before hospital admission. Inappropriate uses of therapy included: general ulcer prophylaxis for low-risk non-critically ill patients, anticoagulant associated prophylaxis, anemia, low dose corticosteroid prophylaxis (less than 250 mg/day of hydrocortisone or its equivalent), no documented indication, and continuation of an inactive outpatient acid suppression regimen. If the indication was considered to be inappropriate, a note was entered in the patients electronic record recommending discontinuation of the acid suppression therapy with the prescribing provider notified as a co-signer. An intervention was considered successful if the acid suppression therapy had been discontinued prior to discharge or was not continued as an outpatient prescription.

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

Learning Objectives:

Identify appropriate indications of acid suppression therapy in non-intensive care patients.

Explain potential consequences of inappropriate acid suppression therapy use in non-intensive care patients.

Self Assessment Questions:

Which of the following are potential consequences of inappropriate acid suppression therapy use in non-intensive care patients?
a)increased risk for Clostridium difficile associated diarrhea infections
b)increased cost and pill burden
c)reduced absorption of calcium supplements
d)increased risk for community acquired pneumonia infections
e)all of the above

True/False: It is recommended that all non-intensive care patients are prescribed a PPI or H2RA for general prophylaxis regardless of indication or risk factors.

RAISING COLORECTAL CANCER SCREENING THROUGH PUBLIC HEALTH AWARENESS

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Purpose:
In the course of impacting the number of colorectal cancer screenings that occur with Family Medicine Center patients, healthcare professionals can strive toward eliminating the needless 18,800 colorectal cancer deaths in the United States that occur each year through lack of screening and awareness. It is important for physicians to educate their patients about their health, but it is equally important to empower those same patients to take an active role in their healthcare. The purpose of this study is to raise the percentage of patients obtaining appropriate colorectal cancer screening at the Family Medicine Center through public health awareness.

Method:
Prior to commencement, the Institutional Review Board approved this study. After assessing the current rate of colorectal cancer screening for the Family Medicine Center, an intervention of mailing educational letters to appropriate patients informing them why it is important to pursue colorectal cancer screening was performed. Roughly 200 patients chosen at random between the ages of 50 and 75 years were included. All data is being recorded without patient identifiers and maintained confidentially. In the coming months after letters were mailed, the rate of colorectal cancer screenings will be tracked in this patient population through chart review. If an improvement in screening exists, this intervention will be incorporated into the Family Medicine Center preventative health policies.

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

Learning Objectives:

State the current recommendations for colorectal cancer screening

Discuss whether public health interventions are beneficial in increasing colorectal cancer screening

Self Assessment Questions:

Which of the following is an appropriate screening method for patients over the age of 85?

The American Cancer Society, the U.S. Multi-Society Task Force on Colorectal Cancer, and the American College of Radiology collectively support the current colorectal cancer screening guidelines

USING THE CHROMOGENIC FACTOR X ASSAY TO MONITOR ANTICOAGULATION WHILE BRIDGING FROM ARGATROBAN TO WARFARIN IN PATIENTS WITH HEPARIN-INDUCED THROMBOCYTOPENIA

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Purpose:
Heparin-induced thrombocytopenia (HIT) is a rare, and serious, adverse reaction to heparin therapy resulting in rapid platelet consumption. When a patient develops HIT, the offending heparin product is discontinued, and a new anticoagulant must be initiated. Since direct thrombin inhibitors (DTIs) do not activate HIT antibodies, they are an ideal option for anticoagulation. Bridging from argatroban to warfarin is a tedious process that involves multiple INRs and titration of the argatroban infusion. The need for multiple INRs can delay patient discharge, and holding the argatroban infusion may place the patient at risk for thrombosis. The American College of Chest Physicians suggests monitoring Factor X activity as an alternative option to the INR when bridging from argatroban to warfarin. Advantages of this approach include less lab monitoring, not holding the argatroban infusion, and the prevention of unnecessary fresh frozen plasma or vitamin K use to reverse a falsely elevated INR. Monitoring Factor X activity appears safer and more convenient than monitoring the INR in this patient population.

Methodology:
A prospective study will be conducted monitoring Factor X activity through the use of the Chromogenic Factor X Assay in patients bridging from argatroban to warfarin. The purpose of this study is to use the Factor X activity level and INR from each blood draw to establish a correlation between the two parameters. The secondary objective is to develop a therapeutic range for Factor X activity that will relate to a therapeutic INR of 2-3. Information collected will include gender, age, weight, INR, Factor X activity level, aPTT, date of each level, time of each level, argatroban dose, and warfarin dose. This data will help determine the clinical appropriateness of this test at Riverside Methodist Hospital.

Results/Conclusion:
Data collection is ongoing. Results and conclusions will be presented at the conference.

Learning Objectives:

Identify the relationship between Factor X activity and the INR when bridging patients from argatroban to warfarin.

Discuss the appropriateness of using the Chromogenic Factor X Assay at a large teaching hospital.

Self Assessment Questions:

T/FArgatroban inhibits Factor X and interferes with the Chromogenic Factor X Assay.

T/FHolding an argatroban infusion for 2 hours is a sufficient amount of time to draw a true INR.

SHORT-TERM MORTALITY AFTER INOTROPIC ADMINISTRATION IN ACUTE DECOMPENSATED HEART FAILURE: A META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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PURPOSE: Inotropes are traditionally used in acutely decompensated heart failure patients presenting with hemodynamic instability. Heart failure guidelines suggest the use of intravenous inotropic therapy only in patients with symptomatic hypotension or combined congestion and low output refractory to treatment with vasodilators or diuretics or in cardiogenic shock. Trials have shown increased mortality associated with the use of inotropic agents, especially versus other vasoactive therapy, and routine inotrope use is not recommended in the acute setting. The purpose of this study is to analyze the available literature to compare short-term mortality rates associated with inotrope administration to standard therapy in acute decompensated heart failure.

METHODS: The primary source used for identification of trials was a literature search for completed clinical trials using PubMed with the search terms dobutamine, milrinone, heart failure and inotropes limited to English, clinical trial, human and Adult:age 19+. The Cochrane Review database and related articles were also searched. Trials were selected for inclusion if they fulfilled the following criteria: clinical trial; patients admitted inpatient with acutely decompensated heart failure; milrinone or dobutamine administered as a continuous infusion after hospital admission; control arm did not mandate administration of inotrope but used placebo or standard of care; mortality reported within 30 days of follow-up; and minimum sample size of ten patients.

RESULTS: 405 studies were reviewed for inclusion. Data collection is in progress. Following data abstraction, death within 30 days will be compared between groups and a meta-analysis will be performed. Final results with conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Discuss the role and appropriateness of inotropic use in the inpatient setting.

Identify mortality rates associated with the use of inotropes in patients admitted with acute decompensated heart failure.

Self Assessment Questions:

What place in therapy do inotropes (ie milrinone, dobutamine) have for treatment of acute decompensated heart failure?

True or false: Inotropes have been shown to cause increased mortality rates when used to treat patients with acute decompensated heart failure.

RITUXIMAB TOLERABILITY WHEN GIVEN BEFORE OR AFTER CHOP

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Background/Purpose

Rituximab in combination with CHOP (R-CHOP) is a common regimen utilized in Non-Hodgkins Lymphoma (NHL). Rituximab is a monoclonal, chimeric antibody that can cause infusion-related reactions (e.g. chills/rigors, flu-like symptoms, angioedema, etc.). Reactions are more common with the first dose and are managed by decreasing the infusion rate and/or temporarily stopping the infusion; however, some patients require pharmacologic therapy in addition to rate adjustment. To our knowledge, there is no evidence that the incidence of adverse reactions is affected by administration sequence for rituximab given with CHOP. At our institution, it has been noticed that patients who receive CHOP prior to rituximab tend to experience fewer infusion-related reactions. The objective of this study is to determine the tolerability of rituximab, specifically acute infusion-related reactions, when it is administered before or after CHOP chemotherapy in patients with NHL.

Methods

The study design is a retrospective chart review. Patients were identified through pharmacy chemotherapy records. To be included, patients had to be at least 18 years of age, diagnosed with NHL, and received their first cycle of R-CHOP as inpatients between January 1, 2004 and June 30, 2009. Patients were divided into two groups on the basis of receiving rituximab before or after CHOP. Demographic and chemotherapy regimen information were collected for all patients. Rituximab starting rate, maximum tolerated rate, and rate at which a reaction occurred were collected. Rituximab tolerability was further assessed through vital signs, evidence of angioedema, chills/rigors, and use of rescue medications. Tolerability was graded using the National Cancer Institute (NCI) Common Terminology Criteria for Adverse Events (CTCAE), version 3.0.

Results and Conclusion

One hundred and fifteen patients were identified who met inclusion criteria (CHOP first n=84, rituximab first n=31). Data analysis is ongoing. The results and conclusion will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Discuss the tolerability of rituximab when administered before or after CHOP.

Recognize the available options for managing rituximab infusion-related reactions.

Self Assessment Questions:

Which of the following is an infusion related reaction of rituximab?
a.Chills/rigors
b.Hypotension
c.Angioedema
d.All of the above

In general, when patients experience an infusion related reaction with their first rituximab cycle, they will continue to experience reactions with subsequent infusions.
a.True
b.False

APPROPRIATE MEDICATION THERAPY INITIATION IN PATIENTS WITH LOW EJECTION (EF) FRACTION CONGESTIVE HEART FAILURE

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Purpose: Inappropriate and/or incorrect initial therapy for patients diagnosed with low EF (≤40%) CHF can lead to worsening CHF, increased cardiac complications and lead to quicker mortality. Currently, the American College of Cardiology/American Heart Association recommends that patients with CHF be on a diuretic (loop, thiazide, thiazide-like or spironolactone), angiotensin converting enzyme inhibitor (ACE) or angiotensin receptor blocker (ARB), beta blocker with or without digoxin. Examining initiation of appropriate guideline directed therapy at the time of a diagnosis of EF ≤40% at the Huntington Veterans Affairs Medical Center (HVAMC) facility will help to determine compliance rates with current guidelines and Joint Commission hospital performance ORYX measures, appropriateness of initial therapy and mortality rates associated with CHF.

Methods: A retrospective chart review of HVAMC patients with a diagnosis of low EF CHF made after January 1, 2006 was performed using the CPRS database. All patient identifiable information was kept within the password-protected HVAMC computer system and patient identifiers were removed from the computerized database and replaced with sequential numbering after the chart review had been conducted. Timeframe of initiation of medications including diuretics, appropriate beta blocker, appropriate ACE/ARB, and digoxin were examined at the time the initial diagnosis of EF ≤40% was documented. Timeframes examined include: at initial diagnosis, within 0-6 months of diagnosis and then >6 months from diagnosis. Two groups were created based on compliance or non-compliance with current guidelines. Primary endpoints include: all cause mortality and number of subsequent admissions for CHF exacerbations within 365 days from diagnosis. Secondary endpoints include: diuretic initiation at discharge, at 0-6 months, or after 6 months; and discharge on digoxin, initiation within 0-6 months, or initiation after 6 months.

Results: Data analysis will be completed in April 2010 and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Identify classes of medications that should be initiated when a diagnosis of CHF EF ≤40% is made.

Understand current guideline recommendations made by the American College of Cardiology/American Heart Association for treatment of CHF.

Self Assessment Questions:

What classes of medications does the American College of Cardiology/American Heart Association currently recommend for all patients with a diagnosis of CHF?
a.ACEI/ARB
b.Beta Blocker
c.Diuretic
d.All of the above

When should an ACE-I be initiated in a newly diagnosed CHF patient?

ASSESSMENT OF SUBCUTANEOUS INSULIN ON GLYCEMIC CONTROL IN THE INTENSIVE CARE SETTING USING A COMPUTERIZED GLUCOSTABILIZER PROGRAM

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PURPOSE: While many clinical trials have shown beneficial effects of intravenous insulin on glycemic control in the critical care patient; no studies have demonstrated efficacy using subcutaneous insulin in this patient population. This study evaluates the efficacy of subcutaneous insulin administration utilizing a computerized program, GlucoStabilizer, on glycemic control in the intensive care unit (ICU).

METHODS: This retrospective study included patients age ≥ 18 years, admitted to an ICU, and initiated on the subcutaneous GlucoStabilizer program. Eligible patients were divided into one of four groups based on initial insulin sensitivity factor (ISF) and carbohydrate ratio (CR). Comparison of initial settings, blood glucose, frequency of blood glucose checks, and glucose range were performed.

RESULTS: Primary endpoints included: time to target glucose, time in target glucose range, percentage of glucose readings within target range, hyperglycemic events, and hypoglycemic events. Secondary endpoints included: length of ICU stay, length of hospital stay, hospital
mortality, occurrence of treatment failure, adjustments in insulin settings, and utilization of basal
insulin. Between January 2009 and June 2009, 1,384 patients were identified. When compared to settings outside the recommended ISF and CR, patients initiated with one of the three predefined settings had more glucose readings within the target range of 100-150 mg/dL (ISF 60 CR 15: 52% vs. ISF 30 CR 10: 46% vs. ISF 15 CR 8: 54 % vs. other: 40%; $p < 0.0001$). Additionally, mean glucose within these groups was lower (ISF 60 CR 15: 135 mg/dL vs. ISF 30 CR 10: 140 mg/dL vs. ISF 15 CR 8: 134 mg/dL vs. other: 143 mg/dL; $p < 0.0001$).

CONCLUSIONS: Use of a subcutaneous insulin program with predefined insulin sensitivity factor and carbohydrate ratio settings leads to tighter glycemic control in adult ICU patients compared to prescriber specified initial settings.

Learning Objectives:

Recognize the effect of subcutaneous insulin on glycemic control in the intensive care setting.

Identify the subcutaneous insulin settings and frequency of glucose checks that resulted in optimal glucose control.

Self Assessment Questions:

True or False: Use of subcutaneous insulin in the intensive care patient provides a viable option for glucose control.

Which of the following insulin sensitivity factor and carbohydrate ratio settings resulted in the largest amount of glucose readings within the target range?
A. ISF 15, CR 8
B. ISF 30, CR 10
C. ISF 60, CR 15
D. Prescriber initiated settings

EVALUATION OF GENTAMICIN DOSING IN PATIENTS AT A TERTIARY PEDIATRIC HOSPITAL

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Background/Purpose: Gentamicin is a broad spectrum antibiotic with a narrow margin of efficacy and significant adverse effects that are affected by a wide range of factors. When used in pediatrics, gentamicin dosing must be adjusted for gestational age, weight, and day of life.
Current dosing guidelines at Childrens Hospital of Wisconsin include 4 mg/kg/dose every 24 to 36 hours, 3.5 mg/kg/dose every 12 hours, and 2.5 mg/kg/dose every 8 hours. Recent studies have shown that 5 mg/kg/dose intravenously every 48 hours may attain a greater frequency of appropriate medication levels in certain patients. The purpose of this study is to evaluate the current dosing guidelines at our institution and the frequency that these doses must be changed due to pharmacokinetic parameters.

Methods: This is a retrospective study of gentamicin doses from January 01, 2007 to December 31, 2009 of pediatric patients at a tertiary pediatric hospital. Data regarding gentamicin has been collected on pharmacokinetic patient monitoring sheets. Relevant information was collected from the sheets as well as available computer systems. Patients were included in the evaluation if they are less than eighteen years of age, received gentamicin during the time frame listed above, had more than one gentamicin level, and had been followed by the pharmacokinetic service at the institution. Patients were excluded from the evaluation if they did not meet all of the inclusion criteria. The primary outcome is the number of doses that required change by a pharmacist after an appropriate weight and aged based dose had been selected. Secondary outcomes will include an evaluation of gentamicin dosing across a variety of gestational age and actual age groups if adequate data is available.

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

Learning Objectives:

Recall neonatal dosing regimens for varying gestational ages and birth weights

Describe various factors associated with adjustments in gentamicin dosing in pediatrics

Self Assessment Questions:

Per current Neofax guidelines: A 28 week gestational age male weighing 700 grams should receive 4 mg/kg of gentamicin every 12 hours. T/F

During the first seven days of life in a term baby, renal function does not need to be taken into consideration for gentamicin dosing as the patients serum creatinine is similar to the mothers. T/F

IMPACT OF EDUCATION IN A GROUP SETTING FOR PATIENTS RELUCTANT TO START INSULIN

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Statement of Purpose:
At the Chalmers P. Wylie VA Ambulatory Care Center over 1,100 patients have a Hemoglobin A1c (HbA1c) >9%. These patients are often reluctant to start insulin despite taking maximum doses of multiple oral medications. These patients would be unlikely to reach HbA1c goal by initiating another oral medication. The primary objective is to compare a patients willingness to start insulin before and after a pharmacists educational intervention in a group setting. Secondary aims of this study are to evaluate reasons patients are reluctant to insulin, evaluate reasons patients decide to start insulin after the intervention, determine the number of patients started on insulin after intervention, examine the mean difference in HbA1c after insulin initiation, and determine a correlation between education level to willingness to start insulin.
Methods:
Patients will be included if they have type II diabetes with HbA1c greater than 7%, are already receiving oral medications, and have refused insulin therapy to their provider in the last 30 days. Patients will be excluded if starting insulin would terminate their employment (i.e. truck drivers), if they are unable to physically give injections, if they are hearing or cognitively impaired, if they have been on insulin before, unable to read, or do not complete the pre-survey or consent forms. The pre-survey will consist of questions regarding their willingness to start insulin. The class will include a presentation on the complications of diabetes and the benefits of insulin. The post survey will again assess their willingness to start insulin, if they are willing, the patient will rate what information changed their opinion. If the patients respond that they are now willing to start insulin, insulin will be initiated by their primary care provider.
Results/Conclusion: Pending and will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Recognize patient barriers to initiating insulin therapy in uncontrolled diabetic patients.

Identify strategies that were successful in overcoming patient resistance to insulin therapy.

Self Assessment Questions:

1)Which of the following do patients typically fear about starting insulin?
a.Lifestyle restrictions
b.Painful injections
c.Social embarrassment
d.Two of the above
e.All of the above

T/F: The majority of patients willingness to start insulin changed after this class.

TITLE: EFFICACY OF THE ENDOTOOL GLUCOSE MANAGEMENT SYSTEM IN THE ICU SETTING

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Background: Elevated levels of glucose often occur in critically ill patients in the ICU. Consequences of high glucose levels are decreased immune function, increased risk of infection, and compromised wound healing. Studies have shown that hyperglycemia and hypoglycemia can increase mortality. As a result, the Edward Hines, Jr. VA Hospital (Hines VA) has adjusted its glycemic goals according to evidence presented in these trials. To maintain these glycemic goals, Hines VA has invested in an electronic glucose management system, the EndoTool System. This system calculates dose adjustments of insulin rapidly and adapts to each patients individual response to insulin. With these advantages, it is believed tighter glycemic control can be maintained and lower incidence of hypoglycemia/ hyperglycemia would be seen.

Purpose: To determine if these potential advantages of the EndoTool System have been elucidated at the Hines VA.

Methods: Subjects will include patients >/=18 years old in the ICU setting during 12/16/08-12/15/09, receiving an insulin drip for 48 hours, and have an average of 10 glucose levels/24-hours. The glycemic goals are defined as 80-120mg/dL for the pre-EndoTool period (12/16/08-6/15/09) and 120-160 mg/dL for the post-EndoTool period (6/16/09-12/15/09). Percent of glucose levels that are within goal, levels >/=200mg/dL, and levels </=70mg/dL will be calculated and baseline characteristics including diabetes diagnosis, admission to the medical or surgical ICU, steroid use, and infections will be collected. Patients achieving the glucose goal >/=80% of the time while on an insulin drip will be defined as having well-controlled glycemic levels. Glucose levels of >/=200mg/dL >/=20% of the time while on an insulin drip will be defined as frequent hyperglycemia. Patients with levels of </=70mg/dL >/=20% time while on an insulin drip will be defined as frequent hypoglycemia. Underlying causes for hypoglycemic events with levels </=40mg/dL will also be sought.

Results/Conclusions: Results and conclusion are pending.

Learning Objectives:

List consequences of elevated glucose levels in critically ill patients.

Recognize potential advantages of an electronic glucose management system.

Self Assessment Questions:

1. Which of the following is NOT a potential consequence of elevated glucose levels in patients in the ICU setting?
A. Increased mortality risk
B. Infection
C. Decreased wound healing
D. Profuse sweating
E. Decreased immune function

2. One advantage of an electronic glucose management system such as the EndoTool System is that it is able to customize a treatment plan utilizing patients individual response to insulin.
A. True
B. False

CONTRIBUTING FACTORS TO MEDICATION ASSOCIATED BLEEDING COMPLICATIONS

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Despite the routine use of guidelines and best practice standards, bleeding complications associated with the use of medications still occur. Most guidelines exclude patients more likely to experience adverse complications. Academic tertiary-care hospitals may have a higher than expected proportion of patients experiencing bleeding complications relative to other types of institutions due to the critical nature of the patients. A voluntary event reporting system is currently in place at our institution. However, it is difficult to capture and accurately quantify the prevalence and severity of the complications. The objective of this study is to identify medications or combinations of medications associated with bleeding complications within an academic tertiary-care hospital.

An online form was developed for pharmacists to submit suspected medication-associated bleeding complications. Patients younger than 18 or greater than 89 years of age, incarcerated patients, and pregnant females will be excluded. The form includes: medication, site of the bleed, symptoms, and a description of the complication. Additionally, a chart review will be conducted to collect patient specific information, including but not limited to: co-morbid conditions, hematologic laboratory values, medications, and procedures. The study will be conducted through the review of medication-associated bleeding complications. Additionally, a retrospective review of medication orders for antidotes and reversal agents for bleeding will be used to identify additional patients who experienced a complication. Bleeding will be classified as either major or minor bleeding events. The incidence of bleeding based on exposure to each medication will also be assessed. Baseline patient characteristics will also be analyzed.

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

Learning Objectives:

List medications and medication combinations associated with an increased risk of bleeding.

Describe a major and minor bleeding event.

Self Assessment Questions:

True/false: Medications and medication combinations associated with bleeding events are well known and recognizable.

True/false: The use of guidelines will eliminate the risk of medication associated bleeding events.

BEVACIZUMAB-INDUCED HYPERTENSION AND THE ASSESSMENT IN ONCOLOGY PATIENTS: THE VITALS STUDY

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Purpose:
Hypertension (HTN) is one of the best-documented and most frequently observed side effects of systemic inhibition of vascular endothelial growth factor (VEGF) signaling by bevacizumab. However, the majority of data reporting all grades of HTN is in the metastatic colorectal carcinoma setting. An overall incidence of 32%, grade 3 HTN (requiring therapy per National Cancer Institute Common Terminology Criteria version 3 [NCI-CTCv3]) of 11-16%, and 1% grade 4 hypertensive crisis have been reported. The reported incidence of HTN could be even higher if we followed a more strict definition and classification of HTN like that of the Joint National Commission (JNC7). There are no clear guidelines to suggest how to manage bevacizumab-induced HTN. We believe that there is a need for further identification of the exact mechanism and incidence of hypertension, for better mechanisms for determining at-risk patients, and a need for recommendations for monitoring and management of bevacizumab-induced hypertension. This would allow patients to receive optimal bevacizumab treatment for underlying oncology indications.

Methods:
The current study is a retrospective, single center observational study conducted at The University Hospital and associated clinics in which all patients, greater than or equal to 18 years of age, being treatment with bevacizumab for an oncology indication will be evaluated from February 2004 to November 2009. Patients will be followed from initiation of bevacizumab up until 6 months after bevacizumab therapy cessation.

Primary outcome measures are the percentage of patients developing any level of bevacizumab-induced hypertension and the severity of hypertension. Secondary endpoints include the percentage of patients who (1) are monitored for HTN and proteinuria; (2) are initiated on antihypertensive medications and/or have medications titrated appropriately; (3) develop HTN-related side effects and complications requiring modification of anticancer therapy.

Results/Conclusions:
Data collection and evaluation remains under investigation.

Learning Objectives:

Understand mechanism and risk factors for developing hypertension with bevacizumab

Recognize necessity for improvement in monitoring and management strategies and recommendations for bevacizumab-induced hypertension

Self Assessment Questions:

1)Mechanisms of anti-VEGF associated hypertension include all the following except:
a.Rarefaction
b.Endothelial dysfunction
c.Involvement of Renin Angiotensin-Aldosterone System (RAAS)
d.Beta-1 receptor agonism

(True/False)The National Cancer Institute Common Terminology Criteria version 3 (NCI-CTCv3) provides more stringent, proactive recommendations for hypertension monitoring and management as opposed to the Joint National Commission version 7 (JNC7) guideline recommendations.

EVALUATION OF OSTEOPOROSIS AFTER HIP FRACTURE

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PURPOSE: Patients with hip fractures are estimated to have a 10% - 20% increased risk of mortality within one year and a 2 to 6 fold increased risk of future fractures. Due to the increased risk of recurrent fractures, current guidelines recommend osteoporosis treatment in those with a prior low impact hip fracture. However, recent data indicate that patients with low impact hip fractures do not receive appropriate osteoporosis therapy upon hospital discharge. The purpose of this study is to determine the prevalence of osteoporosis treatment at discharge among patients admitted to Akron General Medical Center (AGMC) for low impact hip fracture.

METHODS: This study is a descriptive, retrospective chart review of patients with low impact hip fractures admitted to AGMC between January 1, 2005 and December 31, 2008. Participants with low impact hip fracture will be identified through electronic billing records. Patients eligible for inclusion are those 18-49 years of age with a history of corticosteroid use, or any patient greater than 49 years of age. Exclusion criteria include patients with a hip fracture secondary to trauma, a pathologic fracture, and hospice or comfort care patients. Data collection includes demographic information; home osteoporosis medications; prior hip, spine, or wrist fracture; corticosteroid use; diagnosis of osteoporosis upon admission or at discharge; use of a DEXA scan to diagnose osteoporosis; prescribed osteoporosis treatment at discharge; and osteoporosis treatment at any re-admission one year following the initial fracture. The data will be analyzed to determine if patients admitted with low impact hip fracture are prescribed osteoporosis medications upon discharge. The presence of osteoporosis treatment will also be assessed in patients re-admitted to AGMC within one year of hip fracture.

RESULTS: Data analysis is in process. Results to be presented at the conference.

Learning Objectives:

Recognize the 2008 NOF consensus guidelines in treating osteoporosis and preventing future fractures.

Identify the importance of secondary fracture prevention in patients with hip fractures as a result of osteoporosis.

Self Assessment Questions:

True or False: Appropriate osteoporosis therapy per the 2008 NOF guidelines includes the use of calcium, vitamin D, and an anti-resorptive medication.

True or False: Patients ≥ 50 years of age who experience a low impact hip fracture should be routinely started on an osteoporosis treatment regimen.

EFFECT OF PHARMACIST DISCHARGE MEDICATION COUNSELING ON 30-DAY READMISSION RATES IN HEART FAILURE PATIENTS

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Purpose
Heart failure (HF) is a leading cause of hospitalization and mortality in the United States and a new healthcare policy proposes hospitals will receive less reimbursement for 30-day readmissions. One local community hospital currently uses one of two pharmacists to counsel patients on multiple floors at discharge and intervene if necessary. Previous research has shown this service makes an average of 2.07 interventions per counseled patient. We developed this study to determine the effect of pharmacist medication discharge counseling on 30-day readmission rates in HF patients.
Methods
This is a prospective pilot-study using a sample of convenience. Based on the availability of the investigators, patients will receive discharge education from a pharmacist, resident, or pharmacy student (study group) based on the current service, or from a unit nurse (standard care group). A wallet card will be provided to the patient with the final medication list and dosing regimen. Patients in the study group will receive a follow-up phone call at 7 days documenting medications, utility of medication wallet card, and any general disease related questions. Additionally, every patient will receive a 30-day follow-up phone call when medications, utility of the medication wallet card, whether or not the patient has been readmitted to a hospital, been to the emergency department (ED), urgent care or physicians office, and the reason for the admission or visit will be documented.
The primary outcome of the study is all-cause 30-day readmission rates in HF patients. The secondary outcomes are to assess the utility of the medication wallet card, utility of the seven-day follow-up phone call, identification of DRPs, and the rate of ED, urgent care, and physician office visits within 30 days of discharge.
Results
Preliminary results will be presented at Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Describe the beneficial impact of pharmacy discharge medication counseling and follow-up.

Discuss the importance of reducing hospital readmissions in heart failure patients.

Self Assessment Questions:

Research has shown beneficial impact of pharmacy discharge medication counseling and follow-up on all of the following EXCEPT:
a.Adherence
b.Adverse effects
c.Appropriate medication regimens
d.Medication education
e.Time to patient discharge

Reducing hospital readmissions in heart failure is important because:
I.Heart failure is a leading cause of hospitalization in the United States.
II.Heart failure is a leading cause of mortality in the United States.
III.Heart failure admissions account for a proportionate share of CMS spending.
IV.New health care budget may pay less for avoidable hospital readmissions.
a. I and II
b. I, II, III
c. I, II, IV
d. All of the above

ADVANCING THE PHARMACY PRACTICE MODEL: SURVEY OF NEW PRACTITIONER ATTITUDES AND OPINIONS TOWARDS THE FUTURE OF HEALTH-SYSTEM PHARMACY

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New pharmacy graduates are increasingly prepared to make significant patient-care contributions beyond historical expectations of pharmacists. The American Society of Health-System Pharmacists (ASHP) is currently engaged in leveraging resources to advance the profession through an innovative pharmacy practice model initiative. Importantly, the successful implementation of an advanced practice model demands commitment and action from the professional workforce. As the future pharmacy workforce, new practitioners will be directly involved in key changes in practice. New practitioner thoughts about the most effective use of pharmacists and expectations regarding desired future practice roles have the potential to greatly impact the future success of the initiative. The purpose of this study is to measure and assess the attitudes and opinions of new practitioners towards: the current and future state of health-system pharmacy practice, their willingness to accept a changing practice model, and the preparedness of the profession to implement the future model.

The study was conducted using a survey questionnaire distributed electronically via email. Prior to initiation, this study was submitted and determined to be exempt from institutional review board approval. The survey was sent to new practitioners, defined as having graduated from a professional pharmacy program within the past 10 years, who are members of ASHP. The survey was administered using the Qualtrics survey tool and consisted of 37 closed-response questions. The 17-day survey was launched during November 2009 with one reminder email. The survey questions collected: demographic information, characteristics of current pharmacy practice models most and least desired, the responders orientation to change, and information regarding attitudes and opinions about the current state of practice. Data was analyzed to determine trends, establish consensus conclusions, and offer recommendations.

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

Learning Objectives:

Describe the importance of the pharmacy practice model initiative and recognize the impact new practitioners have on the future of pharmacy practice.

Identify those characteristics that are associated with statistically significant differences in new practitioner attitudes, opinions, and pharmacy practice preference (i.e. post-graduate training, geographic region, and year of graduation).

Self Assessment Questions:

True/False: The pharmacy practice model initiative is an opportunity to advance the profession for the betterment of our patients and new practitioners have a crucial role in the initiative.

True/False: Satisfaction with the current state of health-system pharmacy practice in the US was significantly associated with post-graduate training ($p = 0.02$); respondents with post-graduate training had 2.3 times higher odds of being satisfied with health-system pharmacy practice when compared to those without post-graduate training.

THE DEVELOPMENT AND IMPLEMENTATION OF A PHARMACY TECHNICIAN TRAINING PROGRAM

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Purpose:
Pharmacy technicians provide critical support to the pharmacist as integral members of the pharmacy workforce. The hospital pharmacy technician role has undergone substantial change throughout the years, with an increased focus on admixture compounding and distributive functions and technology. A lack of standard pharmacy technician training programs and variations in state requirements for exist. The Aurora Health Care Department of Pharmacy Services hires approximately 25 technicians a year. Turnover is significant, and training is not standardized throughout the thirteen hospitals. By implementing a standard hospital pharmacy based technician training program, all technicians will receive consistent didactic and experiential training. This training will promote the development of higher-level skills demonstrated in todays pharmacy work environment. As a result, pharmacists will have additional time for clinical activities. The primary objective of this project is to develop and implement a pharmacy technician-training program for Aurora Health Care, with plans to achieve ASHP accreditation.

Methods:
The literature was reviewed for pharmacy technician training programs currently in place, and curriculum examples. After literature review was complete, the framework for the program was established. Human resource and administrative approval were obtained. A program advisory group was then established. The majority of the time will be spent working on curriculum development, finalizing evaluation materials, determining experiential sites and securing classroom space.

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

Learning Objectives:

Understand the importance of implementing a technician training program

Describe the barriers to implementing a technician training program

Self Assessment Questions:

Technician training programs are important because currently there are no standard requirements.

List 2 barriers to implementing a technician training program

EVALUATION OF THE MANAGEMENT OF DIABETES MELLITUS IN THE RENAL TRANSPLANT RECIPIENTS

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Purpose: Diabetes mellitus (DM) is the leading cause of end-stage-renal disease in the United States and the most common reason for renal transplantation at The Ohio State University Medical Center (OSUMC). Additionally, post-transplant diabetes mellitus (PTDM) after solid organ transplant has been recognized for many years and occurs in previously non-diabetic patients. Risk factors for the development of PTDM have been reported in the literature and include greater age, higher body weight, ethnicity, and some immunosuppressive medications. Both pre-existing DM and PTDM contribute to the risk for cardiovascular disease and infection in renal transplant recipients (RTx), reducing both long-term graft and patient survival. Hyperglycemia in the early perioperative period has been associated with decreased graft survival in RTx with DM and with increased risk of rejection in RTx without DM. Within the Comprehensive Transplant Center at OSUMC, RTx with DM are managed by a multidisciplinary team. The objectives of this study are multifaceted and include: to evaluate the incidence and management of perioperative hyperglycemia, to characterize the post-transplant management of patients with DM, to report the incidence and characterize the management of PTDM, and to evaluate the effect of PTDM and pre-existing DM on graft function and rejection versus that of patients without DM.

Methods: This study has been approved by the Institutional Review Board. The health systems electronic medical record was used to identify patients who received a renal transplant January 1, 2006 - August 31, 2006. The following data were collected: patient demographics, past medical history including diagnosis of DM and etiology of primary renal disease, renal replacement therapy prior to transplant (hemodialysis or peritoneal dialysis), induction and maintenance immunosuppression regimen, anti-hyperglycemic medications while admitted for transplant and over a 3-year period following, and pertinent laboratory values.

Learning Objectives:

Identify risk factors associated with the development of PTDM

Discuss the impact of DM and PTDM on graft function and rejection.

Self Assessment Questions:

The following are risk factors associated with the development of PTDM:
a.Age greater than 45
b.Body mass index ≥ 30kg/m2
c.Black or Hispanic ethnicity
d.All of the above

T/F: The rate of the development of PTDM has been reported in the literature to be as high as 39% though the precise incidence has been difficult to determine.

CLINICAL PHARMACYS ROLE IN THE APPROPRIATENESS OF ANTIBIOTIC DURATIONA FOCUS ON PATIENTS TRANSFERRED OUT OF THE ICU: THE CONTINUATION STUDY

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Background: Inappropriate use and extended duration of antimicrobial agents contribute to the progression of multi-drug resistant organisms, increased morbidity, and increased patient cost. Over 50% of hospitalized patients receive antibiotic therapy, which represents 30-50% of acute care expenditures. A variety of different interventions have attempted to improve antibiotic use (e.g. automatic antimicrobial stop orders; restricted medication lists; approval by infectious disease specialists; and clinical practice guidelines).

Purpose: To evaluate the impact of direct patient care clinical pharmacists on antibiotic use in patients transitioning from the intensive care unit (ICU).

Methods: This is an investigator-initiated, single-health system, retrospective study conducted at University Hospital in Cincinnati, Ohio. Patients included in the study are adult medical or surgical ICU patients being transferred while receiving antibiotics to non-ICU levels of care within the hospital. Patients are stratified based on (1) presence of defined, prescribed antibiotic stop dates at the time of ICU transfer and (2) presence of a rounding clinical pharmacist on respective accepting service.

The primary outcome of the study is the total duration of antibiotic therapy that was present at the time of transfer out of the ICU. Secondary outcomes include rate of new antibiotic initiation outside of the ICU, cost of antibiotic therapy, length of stay after transfer from the ICU, rate of transfer back to the ICU, and occurrence of resistant bacterial organisms, defined as Pseudomonas aeruginosa, Acinetobacter baumannii, or extended spectrum beta-lactamase producing Enterobacteriaceae isolates resistant to either cefepime, piperacillin/tazobactam, or imipenem or as another organism with new resistance to an antibiotic class. Rates of C. difficile infection are also being assessed.

Results/Conclusions: Analysis of data is ongoing. Results of analysis and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Evaluate the impact of antibiotic stop dates on patients transitioning from ICU to non-ICU levels of care.

Identify the role of the clinical pharmacist in appropriate selection and duration of antimicrobial therapy.

Self Assessment Questions:

True or False There are 5 to 10 times more microbes on and in every human
than there are cells in the human body.

Key strategies to prevention of antimicrobial resistance include:
I. Prevention of Infection
II. Limitation use via hospital formulary restriction, automatic stop dates
III. Face to face education about antimicrobial agents to prescribing physicians
IV. Optimization of antimicrobial therapy
V. Use of world-wide antibiograms

A.I, II, III, IV, V
B.I and IV
C.I, II, IV
D.I, II, III, IV

RETROSPECTIVE EVALUATION OF POSTPOLYPECTOMY GASTROINTESTINAL BLEEDING IN A VA HOSPITAL WITH A FOCUS ON THE ANTICOAGULATED PATIENT

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PURPOSE:
To evaluate the incidence, timing and severity of post-polypectomy bleeding in anticoagulated versus non-anticoagulated patients. The impact of peri-procedural bridging with a low molecular weight heparin (LMWH) on post-polypectomy bleeding rates will also be assessed.

METHODS:
A retrospective medical record review will be performed. All patients who underwent colonoscopy with polypectomy at the William S. Middleton VA Hospital from January 1, 2005-December 31, 2009 will be included. Colonic polypectomy patients will be identified using the procedure codes for polypectomy. Bleeding will be identified using ICD-9 diagnosis codes for bleeding. Anticoagulated patients will be identified through a query of the outpatient pharmacy database for patients who received a prescription for warfarin and/or enoxaparin during the same time frame. 'Cases' will be defined as chronically anticoagulated patients who underwent temporary interruption of their anticoagulation and presented with a postpolypectomy bleed. 'Controls' will be defined as non-anticoagulated patients who presented with a postpolypectomy bleed. Controls will be identified from the same cohort as the cases through random selection using a string of computer-generated random numbers in a 3:1 ratio. This will allow an adequate sample size of controls for statistical confidence. Data collection will include age, gender, hypertension diagnosis, inflammatory bowel disease diagnosis, cancer diagnosis, timing of anticoagulant use around the time of the procedure, polyp size, number of polyps removed, type (sessile vs. pedunculated) of polyps removed, location of polyp removal, INR at time of bleed and immediately prior to the procedure, creatinine clearance, use of aspirin, use of clopidogrel, use of fish oil, use of a proton pump inhibitor, hematocrit level, need for blood transfusion.

RESULTS/CONCLUSION:
Results and conclusions will be presented at the 2010 Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Identify risk factors that increase bleeding risk in anticoagulated patients undergoing colonoscopy with polypectomy.

Describe the 2008 Chest guidelines for peri-procedural bridging in patient undergoing colonoscopy with polypectomy.

Self Assessment Questions:

Multiple Choice: Which of the following are risk factors for bleeding postpolypectomy?
a. polyp size >1 cm
b. use of anticoagulants
c. age > 65
d. all of the above

True or False: Delayed postpolypectomy bleeding has been reported up to 29 days postpolypectomy.

IMPLEMENTATION OF AN EVIDENCE BASED ANTIMICROBIAL ALGORITHM POCKETGUIDE FOR MEDICAL RESIDENTS AND STUDENTS IN THE ACUTE CARE SETTING AT THE CINCINNATI VA MEDICAL CENTER.

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This pharmacy residency project aims to create an evidence-based antimicrobial treatment algorithm pocketguide for medical staff, residents, and students rotating through the Cincinnati VA Medical center. Usage of the pocketguide will also be analyzed.
Authoritative guidelines regarding the following conditions were consulted: bacterial meningitis, antibiotic-associated diarrhea caused by Clostridium difficile, catheter related infections, cellulitis, complicated urinary tract infection, diabetic foot infection, osteomyelitis, and neutropenic fever. Graphic algorithms were created and placed into the pocketguide based on the current evidence based guidelines. These algorithms were reviewed by physicians in the Infectious Diseases department for their appropriateness. Other information contained in the pocketguide, like formulary and cost information, was obtained from the pharmacy department. The pocketguide will be distributed to new medical staff, residents, and students rotating through Cincinnati VAMC. Distribution will be in the inpatient setting on the general medicine ward, the surgical intensive care unit, and the medical intensive care unit. The ER will be excluded, since data will only be collected on inpatients.. A comparison between drugs used for specific conditions before and after implementation of the pocketguide will be conducted. ICD-9 codes related to the conditions outlined above will be selected. A sample of subjects from pre and post implementation will be taken for each ICD-9 code. The subjects antimicrobial regimen will be examined and compared against what is suggested by the pocketguide. Microbial lab data will be collected, if available. Allergy and hospital location information will also be collected as this may affect choice of therapy. Statistics will be limited to descriptive analysis, and conclusions drawn will only be illustrative in nature. At this time, results are still pending.

Learning Objectives:

Outline the process of creating and distributing an evidence based antimicrobial algorithm pocketguide for the acute care setting.

Discuss the usage of the of pocketguide, and potential benefits of such usage.

Self Assessment Questions:

What are the goals of antimicrobial stewardship programs?

What are the advantages of standardized microbial selection and dosing?

IMPACT OF PHARMACIST-DRIVEN DISCHARGE RECONCILIATION ON 30-DAY HOSPITAL READMISSION RATES IN INTERNAL MEDICINE PATIENTS

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Purpose

As of July 2009, the Centers for Medicare & Medicaid Services have added 30-day hospital readmission rate data to its national database as a quality indicator among hospitals. Reducing 30-day readmission rates not only improves hospital performance on a national scale, but also provides opportunities to reduce cost, improve quality of care, and increase patient safety. Clinical pharmacists play an integral role in ensuring appropriate medication use throughout the hospital stay, but pharmacist involvement in the discharge reconciliation process is lacking. The purpose of this study is to determine the impact of a clinical pharmacist-driven discharge reconciliation process 24-48 hours prior to discharge on: 1) reducing 30-day hospital readmission rates, 2) optimizing medication regimens, and 3) overcoming barriers to medication compliance.

Methods

Pharmacists and pharmacy students are evaluating patients for study inclusion based on anticipated discharge within 24-48 hours and excluded if they are not on an internal medicine service at time of discharge. Included patients will have their medication records during their hospitalization and at admission reviewed for appropriateness based on past medical history and in-hospital comorbidities.

Patient interviews are conducted to discuss potential barriers to medication procurement and compliance. Medications lacking an indication, not restarted from admission, inappropriately dosed, or potentially interacting with another medication are discussed with the attending physician. Compelling indications for initiating a new medication based on co-morbid conditions are also discussed with the attending physician. Patients are contacted at day five after discharge to assess compliance and discuss medication adverse effects. Thirty day readmission rates are assessed by phone calls to patients and by searching for new admission documentation in a centralized medical records database shared with multiple hospital systems in the Indianapolis area. The readmission rates will be compared to matched historical controls to assess for effectiveness of pharmacist involvement at discharge.

Results

Results will be presented at Great Lakes Conference.

Learning Objectives:

Recognize areas of opportunity that may potentially decrease hospital readmission rates at 30-days

Identify measurable endpoints where pharmacist involvement can increase the overall quality of care to patients at discharge

Self Assessment Questions:

Which of the following is/are potential reasons for hospital readmission?

For the study presented, all of the following medication-related concerns were reviewed except:

INFLUENCE OF HEART FAILURE WITH PRESERVED EJECTION FRACTION ON THE QT INTERVAL

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PURPOSE: Lengthening of the QT interval can put a patient at risk for life-threatening arrhythmias. There are many known risk factors for QTc prolongation; however, it is unknown whether heart failure with preserved ejection fraction is a risk factor for QTc prolongation. The purpose of this study would be to determine if the presence of heart failure with preserved ejection fraction (PEF) increases a patients risk for QTc prolongation and TdP.

METHODS: This study is a retrospective, observational study. Data was collected from patients admitted to the Cardiac Medical Critical Care Unit and the Advanced Heart Care Unit at Methodist Hospital. Patients were excluded if they did not have a recent echocardiogram, if they had an implantable pacemaker, were pregnant, or were prisoners. Patients were compared based on their baseline QTc interval on admission. Patients were also compared on their EKG response to a potassium channel blocking medication with a known risk of QTc prolongation (e.g. amiodarone, haloperidol, etc). Multivariate regression analysis was also utilized to determine if there was a correlation between the presence of heart failure with PEF and lengthening of the QTc interval. Additionally the data was analyzed to determine if the presence of heart failure with PEF produces a more exaggerated QTc prolongation when patients are exposed to medications known to cause QTc prolongation.

RESULTS: Data has been collected for nine hundred patients; of whom 152 had heart failure with PEF. Data collection and statistical analysis will be completed by April 2010. Final results with conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Outline the risk factors for and consequences of QTc prolongation.

Describe the influence of heart failure with preserved ejection fraction on the QTc interval.

Self Assessment Questions:

List four known risk factors for QTc prolongation

List four medications associated with QTc prolongation

RISK FACTORS ASSOCIATED WITH VANCOMYCIN RESISTANT ENTEROCOCCUS BACTEREMIA IN PATIENTS WITH A HEMATOLOGIC MALIGNANCY OR UNDERGOING HEMATOPOIETIC STEM CELL TRANSPLANT

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The purpose of this study is to establish risk factors of developing VRE bacteremia in patients with a hematologic malignancy, or are undergoing hematopoietic stem cell transplant. Prevention of VRE colonization and infection is ideal in this setting. Secondary outcomes will include risk factors of VRE colonization in this patient population, hospital mortality rate, and mortality rate at day 100.

This is a retrospective, matched case-control study looking at risk factors associated with VRE bacteremia in patients with a hematologic malignancy or undergoing hematopoietic stem cell transplant. Controls will be matched for bacteremia during hospitalization, type of malignancy or bone marrow transplant and chemotherapy regimen. Inclusion criteria are as follows: patients with VRE bacteremia from August 1, 2007 to August 1, 2009, patients with a hematologic malignancy or undergoing hematopoietic stem cell transplant. Exclusion criteria are as follows: Patients less than 18 years and pregnant patients. The primary outcome is to identify risk factors associated with the outcome of vancomycin-resistant enterococcus bacteremia. VRE bacteremia will be defined as: after 3 days in the hospital with 2 or more separately obtained blood cultures or a single blood culture and from concomitant site of infection in clinical scenario of bacteremia.

At Rush University Medical Center, an observed increase in VRE bacteremia has occurred in this patient population, despite contact precautions. The results of this retrospective data collection will then be analyzed to evaluate the risk factors of VRE bacteremia. Risk factors that have been associated with VRE bacteremia include: increased severity of illness, previous exposure to vancomycin, a diagnosis of hematologic malignancy or bone marrow transplant, mucositis, intravascular catheter infection, prior immunosuppressive therapy, patients on dialysis, previous surgical procedures, and antimicrobial therapy on over 80% of hospital days among oncology patients.

Learning Objectives:

Identify risk factors associated with VRE bacteremia in patients with a hematologic malignancy or hematopoietic stem cell transplant.

Identify preventative measures to avoid VRE bacteremia in patients with a hematologic malignancy or hematopoietic stem cell transplant

Self Assessment Questions:

What risk factors are associated with VRE bacteremia?

What is the mortality rate of cancer patients with VRE bacteremia?

CLINICAL ANALYSIS OF VANCOMYCIN ASSOCIATED NEPHROTOXICITY

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Vancomycin is one of the most widely used antibiotics in the United States for treating Methicillin-resistant Staphylococcus aureus (MRSA). The Infectious Diseases Society of America (IDSA), American Health-Systems Pharmacists, and Society of Infectious Disease Pharmacist recently released consensus guidelines for vancomycin monitoring which guide practitioners to aim for vancomycin trough concentrations greater than 10mg/L for patients with mild to moderate infections and between 15-20mg/L for patients with complicated infections (i.e. bacteremia, endocarditis, osteomyelitis, meningitis, and hospital acquired pneumonia). In response, Northwestern Memorial Hospital revised dosing guidelines to reflect these recommendations. Since then, several cases of vancomycin associated nephrotoxicity have been observed.

To systematically assess if nephrotoxicity might be related to dosing changes, a retrospective cohort study will be conducted to evaluate subjects who received vancomycin 1 gram, vancomycin 2 gram, and linezolid since the initiation of the revised vancomycin dosing guidelines. Linezolid will function as a comparator group as it is not known to cause renal toxicity. Patients will be identified utilizing pharmacy and hospital databases. Collected data will include: demographics, age, weight, initial creatinine, peak creatinine during the patients hospital admission, number of doses received, average daily weight standardized dose of vancomycin, total daily doses of vancomycin, co-morbid conditions, concurrent use of nephrotoxic agents, time to first vancomycin serum concentration, highest vancomycin serum concentration, number of vancomycin concentrations >15 mg/L, and number of vancomycin concentrations >20 mg/L. The primary objective will be to determine the factors that may contribute to an increased risk for renal dysfunction in patients who received any of the aforementioned treatment strategies. Renal dysfunction will be defined as a rise in serum creatinine of 50% or 0.5 mg/dl, whichever is greater.

Data analyses are ongoing. Results and conclusions will be presented at the Great Lakes Conference Meeting.

Learning Objectives:

Explain the potential adverse affects of vancomycin.

Explain the patient risk factors that may potentiate nephrotoxicity in patients receiving gram-positive anti-infective therapy.

Self Assessment Questions:

T/F Nephrotoxicity is an adverse affect associated with Vancomcyin.

Recent IDSA guidelines have been modified for practitioners to aim for vancomycin trough concentrations greater than 15-20mg/dL for the following infections:
A)pneumonia
B)osteomyelitis
C)endocarditis
D)bactermia
E)all of the above

CHARACTERISITICS ASSOCIATED WITH ACCURACY OF NON-VA MEDICATION DOCUMENTATION IN THE MEDICAL RECORD IN A HOME BASED PRIMARY CARE (HBPC) POPULATION

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Purpose: Most medical records do not accurately reflect the medications a patient takes, and it has been estimated that only 5.3% of medication lists are correct. Studies have shown that home visits can aid in obtaining an accurate medication list since medications are readily accessible for inspection. Patients enrolled in the Hines HBPC program are assigned a nurse, who visits the patients' homes and obtains detailed information about medication use (including non-VA medications, which are prescription, over-the-counter, or herbal/alternative medications obtained from an outside provider or pharmacy). This program provides the opportunity to compare the accuracy of medication lists before and after enrollment. The primary objective of this study is to determine the characteristics that are associated with accurate ascertainment of non-VA medications in the HBPC population. Secondary outcomes evaluated will include screening for potential drug interactions and duplication of therapy between undocumented non-VA medications and documented medications, and determining if medications lists were appropriately updated in the medical record. A subgroup analysis conducted will compare the accuracy of medication lists recorded by HBPC nurses to medication lists recorded by HBPC pharmacists during home visits.

Methods: Medication lists will be compared before and after HBPC enrollment to assess accuracy of the non-VA medication list. Patient characteristics including age, income, employment status, insurance, number of non-VA providers, location of primary care prior to HBPC enrollment, location of HBPC program, reason for entering HBPC program, number and classes of VA/non-VA medications, and number of disease states will be collected. The data will be analyzed via multivariate logistic regression to determine whether there is an association between inaccurate medication lists and any specific patient characteristic.

Preliminary Results/Conclusions: Data collection is in progress. Final results with conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Describe the Joint Commission of the Accreditation of Healthcare Organizations (JCAHO) Patient Safety Goal 8 and explain the current medication reconciliation process at Edward Hines, Jr. VA Hospital.

Discuss the results of medication reconciliation studies conducted in patients' homes.

Self Assessment Questions:

What factors could contribute to the inaccuracy of a patients medication profile?

Why is an accurate medication profile important to healthcare providers?

QUETIAPINE USE IN A MIXED MEDICAL/SURGICAL INTENSIVE CARE UNIT

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Purpose: The growing body of literature highlighting the negative impact of agitation and delirium in the intensive care unit (ICU) has raised attention on preventing and treating these conditions. Patients experiencing delirium have been shown to have increased mortality, prolonged duration of mechanical ventilation, longer ICU and hospital stays, and increased healthcare cost. Although the negative sequelae of agitation and delirium is well documented, studies on how to best treat these neurological conditions are limited. Traditionally, haloperidol has been the agent of choice to reduce incidence and severity of delirium in hospitalized ICU patients. However, in an effort to reduce the potential side effects associated with haloperidol use, atypical antipsychotics are being utilized more frequently. Further evidence supporting the safety and efficacy of atypical antipsychotics, including quetiapine, in agitation is essential. The purpose of this study is to evaluate clinical outcomes associated with quetiapine use in agitated critical care patients.

Methods: This is a retrospective, single center, chart review comparing clinical outcomes of ICU patients receiving quetiapine versus patients not prescribed quetiapine. Inclusion criteria are adult patients admitted to a mixed medical/surgical ICU having received greater than 48 hours of mechanical ventilation between September 2008 and August 2009. Patient demographics, haloperidol and quetiapine usage, sedation regimens, and opioid usage will be collected. This study will evaluate whether ventilated patients in this ICU who received quetiapine experienced reduced time on the ventilator, reduced time in the ICU, reduced hospital stay, and reduced mortality compared to ventilated patients not receiving quetiapine.

Conclusion: Data collection and evaluation are ongoing. Results and conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:

Describe delirium, including the three subcategories of delirium.

Discuss the impact of intensive care unit (ICU) associated delirium on clinical outcomes.

Self Assessment Questions:

The least common form of delirium in ICU patients is:
a. Hyperactive delirium
b. Hypoactive delirium
c. Mixed (hyperactive & hypoactive) delirium

Delirium is associated with:
a. Increased hospital costs
b. Increased 6-month mortality
c. Prolonged length of hospital stay
d. All of the above

EFFECTS OF A SEVERE SEPSIS SCREENING TOOL ON THE TIMELINESS OF INITIAL TREATMENT AND MORTALITY

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BACKGROUND: Severe sepsis is a major concern among hospitalized patients with mortality rates ranging from 20 to 54%. Early recognition and treatment has been proven to reduce mortality associated with this disease. Unlike other acute illnesses, the initial signs of sepsis are often subtle, nonspecific, and can be easily missed by clinicians. A systematic approach is needed to identify patients early who might be septic. At Methodist Hospital, a screening tool was developed and piloted on two mixed medical/surgical and progressive care units to improve early identification, diagnosis, and treatment of patients at risk of sepsis.

The sepsis screening tool is utilized by nurses of ePartners who routinely monitor these nursing units. EPartners is a system that allows intensivists and critical care nurses to remotely monitor patients from a "central hub", thus complementing the care delivered at the bedside. As part of the screening process, the e-nurses notify the primary physician team of a positive screen. The desired response after notification is timely bedside evaluation and treatment through the utilization of the severe sepsis orderset or similar orders.

METHODS: This study is a prospective, observational review of patients who were screened with the severe sepsis screening tool on two mixed medical/surgical and progressive care units at Methodist Hospital. For patients who screen negative, data collection will consist of patient status (medical/surgical or progressive care), SIRS criteria, and if an infection source is identified. For patients who screen positive, additional information will be collected regarding timing of interventions, laboratory monitoring, medications administered following the positive screening, and patient outcomes.

The primary outcome is to determine the incidence of true positive screens versus false positive screens. Secondary outcomes include assessing improvements in identification of sepsis, timeliness to intervention, and 28-day in-hospital mortality.

RESULTS: Results and conclusions to be presented.

Learning Objectives:

Identify the criteria for systemic inflammatory response syndrome (SIRS).

Explain the differences between sepsis, severe sepsis, and septic shock.

Self Assessment Questions:

All of the following are criteria for SIRS (systemic inflammatory response syndrome) EXCEPT:
a.Temperature greater than 100.9F (38.3C) OR less than 96.8F (36C)
b.Heart rate greater than 90 beats per minute
c.Respiratory rate greater than 20 breaths per minute
d.Systolic blood pressure less than 90 mmHg

True or false: Hypotension is always present in patients with severe sepsis.
a.True
b.False

STRESS ULCER PROPHYLAXIS IN NON-INTENSIVE CARE UNIT INPATIENTS BEFORE AND AFTER A PHARMACIST DIRECTED EDUCATIONAL INTERVENTION FOR INTERNAL MEDICINE PHYSICIANS

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Purpose
To assess the appropriateness of stress ulcer prophylaxis (SUP) use and to estimate the cost associated with inappropriate use in non-intensive care unit (ICU) inpatients on an internal medicine service at University of Louisville Hospital (ULH) before and after a pharmacist-directed educational intervention for physicians.

Methods
This study was conducted at a 404-bed, tertiary care hospital. The study was conducted in three phases, with a total of 51 patients being included in the phase I data collection phase. Phase I included an initial retrospective chart review of adult inpatients at ULH that received omeprazole, pantoprazole, lansoprazole, famotidine, ranitidine, or sucralfate during admission. Data analyzed included risk factors for stress-related mucosal bleeding, the SUP medication that was received, the route and total number of doses of medication received, whether or not SUP was initiated in the ICU, and whether or not SUP was continued upon discharge.

After the initial data collection phase, pharmacists will provide a physician educational intervention regarding appropriate indications for SUP based on the American Society of Health-System Pharmacy (ASHP) guidelines and literature reviews. A phase III post-intervention retrospective chart review will be conducted to re-evaluate the use of SUP in this population.

Results
At the completion of Phase I, approximately 80% of the patients did not meet the criteria for appropriate use of SUP as non-ICU inpatients. The hospital acquisition cost was approximately $14,000 per year while the cost based on AWP was approximately $52,000 per year. Approximately 20% of patients were discharged home on acid suppressive therapy inappropriately.

Results of the phase III retrospective review are pending.

Conclusions
Pending completion of phase III.

Learning Objectives:

Recognize risk factors for stress-related mucosal bleeding in non-intensive care inpatients.

Identify the concerns associated with overuse of stress ulcer prophylaxis.

Self Assessment Questions:

Which of the following is not a risk factor for stress-related mucosal bleeding in non-ICU inpatients?
a. Coagulopathy
b. End stage renal disease
c. Cirrhosis
d. Low dose corticosteroid use
e. Head injury (GCS ≤ 8)

Which of the following is not a concern associated with the overuse of stress ulcer prophylaxis?
a. Risk of Clostridium difficile infection with proton pump inhibitors.
b. Risk of community acquired pneumonia with histamine-2 receptor blockers.
c. Risk for drug interactions with azole antifungals and protease inhibitors.
d. Cost.

EVALUATION OF THE ADMINISTRATION PROCESS OF 2-IN-1 PARENTERAL NUTRITION IN THE PEDIATRIC POPULATION: A PROSPECTIVE REVIEW

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Purpose

Parenteral nutrition (PN) is the second most common class of medications to be associated with errors. Errors can occur anywhere in the prescribing, transcribing, preparing, administering, and monitoring process. Our institution changed from total nutrient admixture to 2-in-1 PN for all pediatric patients in July 2008. A previous study conducted at our institution found an average PN rate of 15 errors per 1000 inpatient orders, with 35% of errors occurring in the administration process.

The primary objective of this study is to evaluate the administration process of pediatric PN orders at our institution. The secondary objective of this study is to analyze the results and bring to a performance improvement team for review and recommendations.

Methods

This study is an eight week prospective review that has been approved by the Institutional Review Board. The administration process of all pediatric PN infusions will be assessed daily. All pediatric PN infusions will be assessed for correct infusion rate, correct patient, appropriate labeling, and expiration date. In addition, the presence of an in-line filter at the correct position below the Y-site of the 2-in-1 admixture and intravenous fat emulsion (IVFE) will be evaluated. Pediatric PN orders will also be assessed to ensure that IVFE bags are being changed every 12 hours. Descriptive statistics will be utilized to evaluate the administration process of pediatric PN orders.

Results

Data collection is currently in progress. Preliminary results show that 87% of pediatric PN orders and 97% of the IVFE orders are infusing at the correct rate. In addition, 81% of the filters are in the correct position, 78% of the IVFE bags have labels on them, and 95% of IVFE bags are being changed every 12 hours.

Learning Objectives:

Explain the rationale for using 2-in-1 parenteral nutrition in pediatric patients

2. Discuss the concerns for infusing intravenous fat emulsion separately from parenteral nutrition

Self Assessment Questions:

Intravenous fat emulsion, when hung separate from parenteral nutrition, should have a "hang time" of how long?

T/F: If a filter clogs during parenteral nutrition infusion, it is okay to remove the filter and continue the infusion

PHARMACY EMERGENCY PREPAREDNESS USING THE INCIDENT COMMAND SYSTEM: EVALUATION THROUGH A MOCK DRILL

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PURPOSE: Following the September 2001 terrorist attacks in the United States, healthcare organizations were asked to participate in the planning and response to crises using the Incident Command System (ICS) to better coordinate response between government agencies. The purpose of this study is to implement a pharmacy incident command system (PICS) to prepare the department to meet the needs of emergency situations and to perform a mock drill to evaluate the PICS.

METHODS: Employees of Harper University Hospital pharmacy department volunteered to participate in this three part, IRB approved study. First, the PICS was developed incorporating the principles of National Incident Management System (NIMS) defined by the Federal Emergency Management Agency (FEMA). Job Action Sheets (JAS) were created outlining the responsibilities for each of the members of PICS. Second, the participants were provided emergency preparedness education through a continuing education (CE) presentation. The participants were asked to complete a pre and post-education survey designed to test basic knowledge of ICS and their confidence level in playing a leadership role within PICS in a crisis setting. Finally, a mock drill will be conducted to evaluate the member roles within PICS and the usefulness of the JAS. The participants of the mock drill will be asked to complete a post-drill survey for the evaluation of PICS.

RESULTS: Pre and post-education survey of 37 participants demonstrated an increased number of correct answers for questions designed to assess knowledge. Likert scale was used to evaluate confidence level which showed a statistically significant ($p < 0.0001$) increase in confidence.

CONCLUSION: CE presentation was effective in increasing both knowledge and confidence level in 37 participants. A mock drill is being planned to further evaluate the PICS and strengthen staff confidence and knowledge of emergency preparedness.

Learning Objectives:

To recognize the current risk to the local area involving emergencies from international border closure, natural disasters, and wide-spread infectious diseases.

To describe the key roles and responsibilities of the leadership positions identified in the Incident Command Structure.

Self Assessment Questions:

The ability to communicate within ICS is absolutely crucial. To ensure efficient, clear communication, ICS requires the use of:
a.Agency-specific codes
b.Radio codes
c.Common terminology
d.Technical language

Which general staff position conducts tactical operations, develops the tactical objectives and organization, and directs all tactical resources?
a.The Payer
b.The Doer
c.The Thinker
d.The Getter
e.The Incident Commander

ASSOCIATION OF HYPONATREMIA WITH SELECTIVE SEROTONIN REUPTAKE INHIBITOR USE IN PATIENTS WITH CLOSED HEAD INJURY

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Purpose:
Hyponatremia has been associated independently with the use of selective serotonin reuptake inhibitors (SSRIs) as well as neurological conditions, including traumatic brain injury. The primary objective of this study is to determine whether or not there is an excessive risk of hyponatremia when SSRIs are used at the time of closed head injury (CHI). Secondary objectives are to determine whether or not there is an increased incidence, duration, and/or severity of hyponatremia among patients taking an SSRI at the time of CHI.

Methods:
This is a retrospective cohort chart review study. The institutions electronic medical record system was used to identify patients with an ICD-9 diagnosis of CHI. All patients that were over 18 years old, had no pre-existing hyponatremia (serum sodium less than 135 mmol/L), were admitted as an inpatient for at least seven days, and survived at least 14 days following CHI were eligible for inclusion. A patient chart review was used to determine the total decline in serum sodium from baseline to nadir over 14 days. The use of an SSRI at the time of CHI was defined as SSRI use within three half-lives of the specific agent prior to CHI or use within 14 days following CHI. A chart review was used to determine if patients had taken an SSRI at the time of CHI and to identify potential confounding factors that may contribute to hyponatremia. To evaluate for heterogeneity among study populations, net fluid intake prior to sodium nadir and Glasgow Coma Scale up to 48 hours after CHI were obtained.

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

Learning Objectives:

Recognize disease states and medications commonly associated with hyponatremia.

Describe proposed mechanisms of selective serotonin reuptake inhibitor-induced hyponatremia.

Self Assessment Questions:

Of the selective serotonin reuptake inhibitors, which one is associated with the highest incidence of hyponatremia?
a.Paroxetine
b.Fluoxetine
c.Sertraline
d.Citalopram

True or false: After the initiation of a selective serotonin reuptake inhibitor, the onset of hyponatremia is typically within 14 days.

EFFECT OF AN ELECTRONIC CLINICAL DECISION SUPPORT (CDS) TOOL ON PRESCRIBER ADHERENCE TO GUIDELINE RECOMMENDATIONS FOR USE OF VITAMIN K

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The 2008 American College of Chest Physicians (ACCP) expert consensus guideline for management of antithrombotic and thrombolytic therapy focuses on the use of vitamin K antagonists including warfarin. A key component of this guideline is the recommendation for management of supratherapeutic INR values. Both undertreatment and overtreatment of supratherapeutic INR have been reported as a result of guideline nonadherence. Either scenario can result in increased morbidity, length of hospital stay, healthcare utilization and cost, and mortality.

Electronic clinical decision support (CDS) integrated into computerized physician order entry (CPOE) systems are becoming more common as health-systems seek to improve safety, prescribing, and adherence to guidelines. Literature describing the impact of CDS for various disease states has been published, but we are unaware of any study examining the utility of CDS for prescribing of vitamin K.

The purpose of this study is to assess the rate of our institutions prescriber adherence to the 2008 ACCP guideline regarding appropriate use of vitamin K. Adherence will be compared before and after implementation of a point of prescribing CDS alert which will be triggered by vitamin K orders in patients taking warfarin. The primary objective is to determine the effect of this CDS alert on prescriber adherence to ACCP guideline vitamin K recommendations. The secondary objective is to determine the incidence of subtherapeutic INR and subsequent need for anticoagulation bridge therapy after vitamin K use.

All adult inpatients receiving vitamin K for an 18 month period were screened for inclusion, and data has been collected for 147 of the anticipated sample of 200 patients. Implementation of the CDS alert is in progress. A second patient cohort will be studied for 18 months after alert implementation, and the two groups will be statistically compared to evaluate the effect of the CDS alert on prescribing.

Learning Objectives:

Explain the 2008 ACCP recommendations for use of vitamin K in the management of supratherapeutic INR due to warfarin.

Describe published rates of adherence to guideline recommendations for vitamin K use.

Self Assessment Questions:

Which of the following describes a clinical scenario consistent with the 2008 ACCP guideline recommendations for use of vitamin K? A patient taking warfarin 5 mg by mouth every evening is found to have:
a. An INR of 11.5 and no evidence of bleeding; the patient should receive vitamin K 10 mg intravenously (IV).
b. An INR of 7.6 with a few small bruises on the arms; the patient should receive vitamin K 5 mg subcutaneously (SC).
c. An INR of 4.8 with signs of minor bleeding from the gums; the patient should receive vitamin K 2.5 mg orally (PO).
d. An INR of 3.6 with evidence of intracranial hemorrhage after a fall; the patient should receive vitamin K 10 mg intravenously (IV).

Which of the following correctly indicates the overall rate of prescriber adherence to the 2008 guideline recommendations for use of vitamin K according to published literature?
a. < 10 %
b. 10-20%
c. 20-30%
d. 30-40%

EVALUATION OF A STANDARDIZED SEPSIS SCREENING TOOL

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Purpose: While there have been numerous developments in the treatment of sepsis since the Surviving Sepsis Campaign was initiated, recognizing sepsis remains a hindrance to implementation of appropriate treatments. The Indianapolis Coalition for Patient Safety (ICPS) sepsis workgroup, comprised of area hospitals, was formed in order to standardize sepsis screening and treatment throughout the metropolitan area in order to decrease morbidity and mortality associated with sepsis. The first step the ICPS workgroup has decided to implement is a sepsis screening tool. As a participating member of the workgroup, Wishard Memorial Hospital piloted sepsis screening on one medical-surgical unit. The purpose of this study is to determine the sensitivity and specificity of the tool for sepsis screening and characterize physician action after a positive screen occurs.

Methods: The study is a retrospective review of a piloted sepsis screening tool. Prior to implementation of the screening tool, education was provided to nurses, pharmacists, and physicians servicing the pilot unit. The pilot phase was initiated in October 2009 and completed at the end of November 2009. Sepsis screening was completed by nurses twice daily on one medical-surgical unit during this phase. The tool consists of two questions used to assess for signs and symptoms of systemic inflammatory response syndrome and sepsis. Physicians were notified of positive screens. Data collection includes status of each screen completed, time and date of admission, time and date of screen, admitting service, physician action, laboratory tests, antibiotics, cultures, and fluids ordered after a positive screen, length of hospitalization, and disposition upon discharge. Sepsis ICD9 codes have been collected to determine sensitivity and specificity of the tool.

Results/Conclusions: During the pilot, a total of 1906 screens were completed. Approximately 50% of screens were completed on surgical patients and 50% on medical patients. Additional results and conclusions to be presented.

Learning Objectives:

Describe a method for sepsis screening on a medical-surgical unit.

Identify barriers to successful sepsis screening initiatives.

Self Assessment Questions:

Early detection of sepsis and implementation of goal-directed therapy has been shown to have no impact on sepsis mortality rates. T/F.

Considerations for effective sepsis screening initiatives must include all of the following except: amount of dedicated nursing time needed, patient acuity, or method of documentation.

CLINICAL OUTCOMES WITH DAPTOMYCIN IN THE TREATMENT OF METHICILLIN-RESISTANT STAPHLOCOCCUS AUREUS (MRSA) AND VANCOMYCIN-RESISTANT ENTERCOCCUS FAECALIS OR FAECIUM (VRE) BACTEREMIA

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Purpose

There are limited options for the treatment of methicillin-resistant Staphylococcus aureus (MRSA) and vancomycin-resistant Enterococcus faecalis or faecium (VRE) bloodstream infections. Vancomycin continues to be the antibiotic of choice for the treatment of MRSA bacteremia. However, studies have demonstrated that prior vancomycin exposure and increasing minimum inhibitory concentrations (MIC) of MRSA isolates to vancomycin may be associated with treatment failure. Daptomycin, a cyclic lipopeptide, is approved for the treatment of Staphylococcus aureus (SA) bacteremia and is an effective alternative in the treatment of VRE bacteremia. Daptomycin is FDA approved at a dose of 6 mg/kg for the treatment of SA bacteremia and VRE infections. However, current literature suggests that doses up to 12 mg/kg are well tolerated and may provide additional efficacy in the treatment of organisms with a vancomycin MIC ≥ 2 or in organisms with a higher MIC to daptomycin, including VRE.

Methods

A retrospective study was conducted on patients admitted to a large academic teaching hospital with a culture confirmed bloodstream infection of MRSA or VRE between January 1, 2006 - December 31, 2009. The objective of this study was to evaluate the clinical and microbiological outcomes associated with daptomycin in the treatment of MRSA or VRE bacteremia. In addition, clinical and microbiological outcomes were compared in patients who received ≤ 6 mg/kg of daptomycin with patients who received > 6 mg/kg of daptomycin for a minimum duration of three days.

Results

The results and conclusion will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Describe the spectrum of activity and pharmacodynamic properties of daptomycin

Discuss the rationale of utilizing high dose daptomycin (> 6 mg/kg) for MRSA and VRE bacteremia

Self Assessment Questions:

Daptomycin is a lipropeptide antibiotic that

A.Has a gram-positive and gram-negative spectrum of activity with concentration-dependent bactericidal killing

B.Has a gram-positive spectrum of activity with concentration-dependent bactericidal killing

C.Has a gram-positive and gram-negative spectrum of activity with time-dependent bactericidal killing

D.Has a gram-positive spectrum of activity with time-dependent bactericidal killing

E.Has a gram-negative spectrum of activity with a concentration-dependent bacteriostatic killing

Daptomycin is not effective in treatment of susceptible MRSA/VRE for

A.Urinary tract infections

B.Catheter-related blood stream infections

C.Endocarditis

D.Pneumonia

E.Osteomyelitis

ASSESSMENT OF A DIABETES INITIATIVE IMPLEMENTED IN BEHAVIORAL HEALTH PATIENTS AND THE EFFECTICENESS OF ITS ABILITY TO MANAGE BLOOD GLUCOSE

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Background: Psychiatric illness has been associated with poor glucose control, and poor glycemic control has been associated with psychiatric illness. During inpatient hospitalizations, blood glucose is a major concern because of the well understood complications associated with hyperglycemia. Blood glucose can be managed during inpatient hospitalizations with oral medication or an insulin regimen and the results can be easily monitored by a capillary blood glucose reading. An initiative was recently implemented to monitor behavioral care patients blood glucose readings and ensure ADA recommendations are met.

Purpose: The purpose of the study is to assess the effectiveness of the new initiative to control blood glucose in behavioral care patients based upon ADA goals when compared to glucose control in patients admitted prior to the implementation of the initiative.

Methods: A retrospective chart review of approximately one hundred patients aged 18-89 years in two behavioral care units at Community Hospital North (CHN) will be conducted. The time frame for the study will be May 2009 to July 2009 (pre-initiative) and September 2009 to October 2009 (post-initiative) with approximately equal numbers (i.e. 50 patients) between the two periods.) Patients must have 5 or more point-of-care blood glucose readings.

Sovera, diabetes management reports, and Centricity Administration will be utilized to collect necessary data to fill out a universal data collection form. The primary endpoint is to determine the percent of time patients meet ADA fasting goals in the pre- vs. post-initiative groups. Secondary objectives are defined as follows: Percent of patients with hypoglycemia, percent of patients with hemoglobin A1c > 7, maximum blood glucose reading, and patients average blood glucose during hospitalization.

Results and Conclusions: Data collection is currently ongoing and will be presented at Great Lakes.

Learning Objectives:

Recognize patients at risk for uncontrolled blood glucose

Identify areas of weakness pertaining to blood glucose

Self Assessment Questions:

Psychiatric patients are prone to hyperglycemia. T/F

Which of the following factors must be monitored in diabetes patients:
a)HbA1c
b)Fasting glucose
c)Post Prandial
d)All of the above
e)None of the above

IMPLEMENTATION OF A BAR-CODED MEDICATION ADMINISTRATION SYSTEM IN A REHABILITATION UNIT AND A NEONATAL INTENSIVE CARE UNIT

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BACKGROUND: Medication errors have been described as one of the most common, serious, and costly causes of adverse events in hospitalized patients in the United States. A significant portion of the mistakes occur at the point of drug administration. Many technological advances have been developed to prevent medication errors. One example is bar-code medication administration (BCMA), which involves matching the bar code on a medication to one on patients wristband or identification bracelet prior to administration. The Care Mobile Project at Advocate Lutheran General Hospital will implement a bar-coded medication administration system on two patient care units of the hospital. The implementation of this new technology is designed to assist hospital staff in improving medication safety and information management.

PURPOSE: To evaluate the impact that the Care Mobile Project may have on medication safety based on the error rate pre- and post- implementation of the BCMA system.

METHODS: During both the pre- and post-implementation periods of the Care Mobile Project, patients on the rehabilitation and the neonatal intensive care units receiving one or more medications will be included in the study. For each study patient, data to be collected include number of medication errors, number of baseline drivers, and number and type of workarounds observed. The primary outcome of the study is the measurement of certain baseline drivers in the medication administration process in the rehabilitation unit and the neonatal intensive care unit and their effect on the occurrence of medication errors before and after the implementation of a BCMA system. The secondary outcome of the study is to identify workarounds to the BCMA process after the implementation of the new system and develop solutions to prevent future workarounds.

RESULTS AND CONCLUSIONS: Results and conclusions will be presented at the Great Lakes Pharmacy Residents Conference.

Learning Objectives:

Describe BCMA and its role in the medication administration process.

Identify workarounds to the use of BCMA and their impact on the effectiveness of the system.

Self Assessment Questions:

What is BCMA and how does it prevent medication errors from occurring during the medication administration process?

Which of the following is an example of a workaround to the BCMA system?
A. Nurse types the patients identifier into the system rather than scanning the patients wristband.
B. Nurse affixes patients wristband on the bedside rather than on the patient to expedite scanning.
C. Nurse keeps a second set of printed patient wristbands for scanning in the medication room.
D. All of the above

IMPROVEMENT OF CONTROLLED SUBSTANCE MANAGEMENT PRACTICES

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Purpose:
It has been estimated that 70% of controlled substance diversion involves nursing staff. Drug abuse and diversion can lead to lost employee productivity, potential liability, and most importantly poor patient care due to impaired healthcare staff and patients not receiving their medications. Therefore, it is crucial to maintain proper documentation of all aspects of controlled substance management from the point that a drug enters into the pharmacy to the time the drug is administered to the patient. The purpose of this study is to evaluate controlled substance management at Saint Margaret Mercy Healthcare Center.

Methods:
Each step in the medication pathway was assessed, from the accuracy of purchasing to the final administration and documentation of waste. Using automation reports and medical chart data, four components of controlled substance management and documentation were assessed. The first component consisted of verifying that the amount of medication received by pharmacy to the invoices. The second component compared the amount of medication removed from the pharmacy to what was reported as added into all automated dispensing machines (ADM). The third component consisted of a retrospective medication use evaluation (MUE) analyzing that the amount of medication removed from an ADM corresponded with what was documented as administered, wasted, or returned to the ADM. The fourth component, an analysis of discrepancies created by medications stocked in the ADM, was performed to assure that discrepancies were resolved within a reasonable time frame (<48 hours) and documented appropriately. After assessment of data, focus was directed towards improvement of hospital procedures to minimize discrepancies in all the steps in the medication pathway. Post- MUE data will be collected to determine if changes made were effective.

Results/Conclusion:
Results and conclusion will be presented at Great Lakes Pharmacy Conference April 2009.

Learning Objectives:

Discuss the importance of evaluating all processes involving controlled substance management in the hospital.

Identify opportunities to close the gaps found in controlled substance management process.

Self Assessment Questions:

Which of the following is NOT an outcome of drug diversion?
a. Poor patient care
b. Lost employee productivity
c. Potential liability
d. Increased hospital cost savings

True or False. Majority of substance diversion involves nursing staff.

EVALUATION OF A DEXMEDETOMIDINE PROTOCOL CHANGE IN THE INTENSIVE CARE UNIT

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Dexmedetomidine is an α2 agonist used for sedation in the intensive care unit (ICU). Recent studies have demonstrated efficacy and safety with higher doses for longer durations. In July 2009, our academic medical center amended its protocol to allow a maximum dose of 1.4 mcg/kg/hr. Loading doses are not recommended and dose increases should be made no more frequently than 30 minutes. The primary objective of this study is to evaluate the efficacy and safety of a protocol change allowing high dose dexmedetomidine (>0.7mcg/kg/hr) for patients in the ICU.

A retrospective study was conducted and included patients who received dexmedetomidine in the medical, surgical, mixed medical/surgical, and cardiothoracic intensive care units. A sample of patients who received dexmedetomidine prior to the protocol change and all patients treated after the protocol change until December 2009 were included. Patients who were pregnant, imprisoned, less than 18 or greater than 89 years of age were excluded. Efficacy was determined by the percent of time the patient was maintained at goal (-1 to +1) on the Richmond Agitation and Sedation Scale (RASS). The incidence of hypotension and bradycardia was used to assess safety.

Forty-three of the 133 included patients received high dose dexmedetomidine. Patients in the high dose group had significantly fewer RASS scores at goal (56.1% versus 44.9%; $p<0.05$). Hypotension was the most common adverse effect (37.6%) and was more common in those whose dose was increased more frequently than 30 minutes ($p<0.05$). There was no difference in the incidence of hypotension or bradycardia between high and low dose dexmedetomidine.

In conclusion, patients treated with higher doses spent less time at goal RASS. While there was no difference in the rate of adverse effects between the two dosing groups, hypotension was more common in patients whose dose was increased sooner than recommended.

Learning Objectives:

Discuss appropriate indications for the use of dexmedetomidine.

Identify potential risk factors that lead to the development of dexmedetomidine-related adverse effects.

Self Assessment Questions:

Dexmedetomidine is frequently used for which of the following indications?
A.Procedural sedation in non-intubated patients
B.Ongoing sedation in mechanically ventilated patients
C.Treatment of substance withdrawal
D.Facilitation of extubation
E.All of the above

Which of the following is potential serious adverse effect of dexmedetomidine?
A.Renal insufficiency
B.Hepatic insufficiency
C.Atrial fibrillation
D.Hypovolemia
E.None of the above

PATIENT AND GRAFT SURVIVAL FOLLOWING ORAL LOADING OF MYCOPHENOLATE MOFETIL (MMF) VERSUS ORAL LOADING OF ENTERIC-COATED MYCOPHENOLIC ACID (EC-MPA) VERSUS STANDARD MMF DOSING IN RENAL TRANSPLANT RECIPIENTS.

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Background: Mycophenolic acid (MPA) is available as MMF and enteric coated MPA. Maximum efficacy of MPA is reported when AUC > 30 mg*h/L, with early adequate exposure decreasing AR rates. Using standard (std) MMF dosing of 2g daily, 1 study showed that only 46% pts achieved AUC > 30 mg*h/L . In 2008, we demonstrated that an EC-MPA loading dose in 20 African American (AA) RTX recipients achieves goal AUC by POD4 in 86% of patients. We then implemented an equivalent LD of MMF for all RTx recipients to lower AR rates.

Aim: To compare 6 mo pt and graft survival between EC-MPA oral load, MMF oral load, and std MMF dosing. To compare the PK of a subset of the 2 loading strategies.

Methods: In a retrospective review of 60 AA RTxs, 20 pts received EC-MPA oral load, 20 pts received MMF oral load, and 20 pts received std MMF dosing. Equivalent dosing was used in each oral load group. The std group received 1000mg bid starting day 1. Five pts in MMF oral load group will undergo a PK study to compare to the EC-MPA PK data.

Results: Patient survival at 6 mos was 100% in both EC-MPA oral load and MMF oral load and 95% in MMF std dose. GS at 6 mos was 100% in MMF oral load and MMF std dose and 95% in EC-MPA oral load. Biopsy-proven rejection was 10% in MMF std dose, 25% in the EC-MPA oral load, and 0% in MMF oral load. Incidence of all rejections, biopsy-proven and empirically-treated, was 20% MMF std dose, 25% in EC-MPA oral load, and 36% in MMF oral load.

Conclusion: In this high risk population, use of MPA oral load may reduce early ACR. Further PK comparison between EC-MPA and MMF is underway.

Learning Objectives:

To compare outcomes, in terms of patient and graft survival at 6 months, among patients who received the EC-MPA oral load versus the MMF oral load versus standard MMF dosing.

To compare the kinetic profiles of a subset of the mycophenolate mofetil oral load and the mycophenolate sodium oral load.

Self Assessment Questions:

The purpose of an oral load of mycophenolic acid is to achieve therapeutic AUC earlier post-transplant.

A) True B) False

Early adequate exposure to MPA has been shown to decrease acute rejection rates.

A) True B) False

EFFECTS OF EARLY STEROID WITHDRAWAL ON RENAL TRANSPLANT OUTCOMES IN AFRICAN AMERICANS

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Purpose:
Corticosteroids have played a fundamental role in the prevention of allograft rejection in renal transplant patients for many decades; however, their myriad of adverse effects have facilitated a paradigm shift towards minimization of steroids as part of maintenance immunosuppression. Scientific literature indicates long-term success of early steroid withdrawal (ESW) in a general population of patients, yet there remains limited data on its safety and efficacy in higher risk populations, specifically African Americans. Some available evidence suggests ESW in African Americans is associated with successful graft and patient survival with decreased post-transplant complications, e.g. new onset diabetes and hyperlipidemia. However, there is conflicting evidence concerning the incidence of acute rejection (AR) in African Americans post-transplant, particularly with long-term follow-up. The primary objective of this study was to compare the incidence of acute rejection in African American renal transplant patients following early steroid withdrawal (ESW) versus steroid maintenance (SM) immunosuppression. Secondary objectives included comparing rates of graft survival, patient survival, and post-transplant complications.

Methods:
The research design was a single-center, retrospective cohort study of patients who underwent cadaveric or living renal transplantation at the University of Illinois Medical Center at Chicago (UIMCC) between the years of 1997-2007. Inclusion criteria included age of 18 years or older and self-identified African American descent. Multiple organ transplants were excluded from the study. Patients were placed into either the early steroid withdrawal (ESW) group or the steroid maintenance (SM) group based on the protocol outlined at the time of renal transplantation. Patients were followed up to 42 months post-renal transplant.

Results/Conclusions:
Data collection is currently ongoing. Preliminary results show incidence of AR at 6 months in 3/16 (18.8%) patients in the ESW group versus 5/11 (45.5%) patients in the SM group. Final results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Identify the risks and benefits of early steroid withdrawal in renal transplant patients.

Recall post-renal transplant complications, such as new onset diabetes, hyperlipidemia, and weight gain.

Self Assessment Questions:

1. Which of the following patient populations is at highest risk of renal allograft rejection:
a. elderly patients
b. Caucasian patients
c. African American patients
d. they are all at equal risk

2. Chronic steroid use is associated with all of the following except:
a. glucose intolerance
b. sodium wasting
c. hyperlipidemia
d. avascular necrosis

JUSTIFICATION AND EXPANSION OF PHARMACY SERVICES IN THE EMERGENCY DEPARTMENT

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Background: Froedtert Hospital, an adult Level I Trauma Center and academic medical center has over 60,000 emergency department (ED) patient visits each year. Currently, the ED staffs a full time pharmacist from 0900-1930 seven days a week. The responsibilities of the emergency department pharmacist include completing medication histories, involvement in trauma, stroke and code four calls, as well as answering medication inquiries and making recommendations. The emergency departments high volume and fast-paced environment increases the risk for medication errors and misuse. The purpose of this project is to evaluate the interventions provided by emergency department pharmacists in order to justify expanding hours of pharmacist coverage. The main objectives of this project include defining optimal hours of ED expansion, identifying the interventions commonly provided by the ED pharmacist in order to justify their role in providing safe and effective patient care, and creating a business plan that can be presented to executive staff.

Methods: A questionnaire designed to describe the perceived value of pharmacists in the ED was prepared and distributed to all ED prescribing practitioners. The questionnaire responses will be used to evaluate possible hours of expansion, utilization of ED pharmacists, and areas in which services may be added or expanded. In addition, documentation of pharmacist interventions in the ED was collected. These interventions will be classified into the following categories: increased patient safety, medication error avoidance, cost-effective medication management and/or enhanced efficiency of other ED clinicians. The questionnaire responses and intervention data will be used to create a business plan justifying pharmacist involvement in the safety and cost effectiveness of medication use and overall patient care in the ED.

Results and conclusion: Definitive results of the questionnaire, intervention data collection, and business plan support additional pharmacist coverage and will be presented at the Great Lakes Residency Conference.

Learning Objectives:

Recognize the importance of having a clinical pharmacist in the emergency department

Identify areas where clinical pharmacists can improve patient quality and safety measures in the emergency department.

Self Assessment Questions:

T/F Research shows the emergency department is one area with the highest rates of medication errors.

T/F There is little need for the clinical pharmacist to be involved in administrative roles affecting the emergency department.

REDUCING 30-DAY READMISSION RATES FOR HEART FAILURE PATIENTS - THE ROLE OF A PHARMACIST IN DISCHARGE MEDICATION RECONCILIATION

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Purpose: The Centers for Medicare and Medicaid Services (CMS) report national 30-day readmission rates of 24.5% for heart failure (HF) patients with original Medicare. The current hospital readmission rate for HF patients at Aurora St. Lukes Medical Center is 20.6%.
Pharmacist involvement in an interdisciplinary health care team has been shown to decrease 30-day hospital readmission rates in high-risk older persons. The 2009 ACCF/AHA Heart Failure Guidelines consider written discharge instructions or educational material given at hospital discharge a critical performance measure for patients with HF. Within this patient population, medication discharge instruction discrepancies currently account for 76% of CMS fallouts at this facility. At this time, pharmacists are not involved in the discharge medication reconciliation process at this facility.
The primary objective of the study is to reduce 30-day hospital readmission rates in the intervention group of heart failure patients by involving pharmacists in the discharge medication reconciliation process. The secondary objective of this study is to reduce CMS fallouts related to discharge medication instruction discrepancies on the intervention floor for heart failure patients.

Methods: The nursing staff notifies the pharmacist of a HF patient discharge.
The clinical pharmacist reviews the physician completed medication discharge reconciliation form for completeness, follows up on discrepancies, and recommends therapeutic changes or monitoring. The pharmacist then provides written counseling with emphasis on HF related medications that are relayed to nursing. Nursing provides counseling and HF related materials to the patient.

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

Learning Objectives:

Describe the importance of written medication instructions at hospital discharge in the transition of care.

Identify the impact of pharmacist involvement in the discharge medication reconciliation process.

Self Assessment Questions:

List one medication-related reasons for a readmission to the hospital by heart failure patients.

List two types of errors identified by pharmacists in the discharge medication reconciliation process.

IMPLEMENTATION OF PHARMACIST INTERVENTION DOCUMENTATION WITHIN AN ELECTRONIC HEALTH RECORD

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PURPOSE: Inpatient pharmacists provide daily clinical impact by preventing adverse drug events, optimizing therapies, completing medication reconciliations and monitoring patient therapy. Documenting pharmacist interventions can be instrumental in maintaining current clinical programs, monitoring pharmacist workload, and justifying future development. Electronic systems are easier to use, more efficient, and provide superior analysis capabilities compared with manual tracking systems. The purpose of this project is to pilot and assess a pharmacist intervention documentation tool contained within the current electronic health record system in a community hospital.

METHODS: Nine types of interventions were identified for the pilot based on estimated high volume, clinical impact, time spent, or potential cost avoidance. The project team determined the significance and estimated average time spent on each selected activity. To improve efficiency and reduce subjectivity, the documentation tool was constructed to automatically populate the "Time Spent" field based on the type of intervention and significance selected. During the initial trial period, pharmacists documented actual time spent on the intervention, including documentation. One type of intervention per data collection day was evaluated to generate a random snapshot of daily clinical impact. Interventions were documented over a 6-week time period. The primary outcome is actual time spent on interventions compared with estimated average time spent. Data on total numbers of each type of intervention performed daily per total patient load will also be analyzed. Future documentation and reporting schemes to assist the Pharmacy Department in monitoring pharmacist workload, and justifying programs or pharmacist positions to the Hospital Administration can be developed based on the pilot study results.

RESULTS/CONCLUSIONS: Data collection is currently in process. Final results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

List ways that inpatient hospital pharmacy departments can utilize pharmacist intervention documentation.

Discuss the benefits of electronic documentation systems over manual tracking systems.

Self Assessment Questions:

Documenting pharmacist activities and interventions can be useful to pharmacy departments in:
a. Monitoring pharmacist workload
b. Expanding clinical programs
c. Adding new pharmacist positions
d. All of the above

True/False. Due to user acceptability, electronic systems can potentially lead to an increased number of documented interventions compared with manual tracking systems.

EFFECT OF UNCONVENTIONAL WEEKLY ROSUVASTATIN DOSING ON LDL-C LOWERING AND PATIENT TOLERABILITY IN A VERTERAN POPULATION

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PURPOSE: The PROVE IT and REVERSAL trials showed significant reduction in lipid levels and cardiovascular morbidity and mortality with aggressive statin dosing. However, some patients discontinue treatment due to intolerable side effects despite requiring statin therapy for primary and secondary cardiovascular risk reduction. The pharmacokinetic profile of rosuvastatin renders it a viable option for weekly dosing. The purpose of this study is to evaluate the "effectiveness" of unconventional rosuvastatin as defined primarily by crude LDL-C lowering and secondarily by attainment of Adult Treatment Panel-III recommended LDL-C targets.

METHODS: The study is a retrospective chart review performed at the Ann Arbor VA of patients who received a prescription for unconventionally dosed rosuvastatin from the Ann Arbor or Battle Creek VA between February 2008 and August 2009. Patients will be excluded from the study if they initiated, discontinued or changed dose of other anti-hyperlipidemic medications during the study period. Descriptive data recovered from the chart will include: age, gender, relevant comorbidities, concomitant use of medications that could affect lipids, history of statin-related adverse effects, adherence, length of statin therapy and reasons for treatment dose changes, continuation or termination. Lab parameters collected will include: lipid panel results, liver transaminases and creatinine kinase levels at baseline; 6-9, 10-14, 15-19 weeks; and 6-11, 12-17, and 18 months as long as available. Appropriate statistical analysis will be performed on the population as a whole, and also for two dosing categories: <10mg and ≥10mg rosuvastatin/week.

RESULTS/CONCLUSIONS: Data collection and statistical analysis will be completed by April 2010. The project will be presented in its entirety at the Great Lakes Residency Conference, May 2010.

Learning Objectives:

Explain the importance of continuing statin therapy in light of intolerance given incidence of high risk factors in the Veteran population.

Describe a dosing and monitoring strategy for unconventional rosuvastatin therapy.

Self Assessment Questions:

T/F The half-life of rosuvastatin is ~19 hours

Which of the following is NOT a major risk factor that would modify LDL-C goals?
a.)Cigarette smoking
b.)Hypertension (blood pressure >140/90 mmHg or on medication)
c.)Low high-density lipoprotein cholesterol (<40 mg/dL)
d.)Family history of premature coronary heart disease (male first degree relative <55 years; in female first degree relative <65 years)
e.)Gender

USING LEAN PRINCIPALS TO DECREASE MISSING MEDICATIONS

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Purpose: To reduce missing medication and cost of re-work by pharmacist and nursing staff through a series of rapid process changes at Aurora West Allis Medical Center.

Methods: Current literature was reviewed for the use of lean principals in the health care setting. A multidisciplinary team consisting of intensive care unit (ICU) nursing and pharmacy staff was created and studied determine the current process of medication delivery to ICU. Pre-process change data has been collected concerning missing medication requests in regards to type of delivery method, time of day, and number missing per day. From the process review (walk through) and data collected, the multidisciplinary team developed a list of potential redesign changes to implement. (Examples: cartfill redesign, developing an expectation list for nursing, creating standard of practice for both pharmacy and nursing). The process changes were implemented in the ICU as a pilot prior to implementation hospital wide.

Preliminary Results: Initial data on one nursing unit showed an average of 5.5 RN requests for a missing medication per day. After implementation of a number of process changes the number of RN requests for missing medications was reduced to 3.5 medication requests per day. This is a 40% reduction in RN requests for missing medications.

Conclusion: Through a series of rapid process changes, the number of missing medications on one nursing unit has been decreased.

Learning Objectives:

Describe why it is important to classify collected data.

Identify 'Lean' principals/tools used in process re-design.

Self Assessment Questions:

List two considerations when identifying potential members of an interdisciplinary team?

List one reason why a process walk through is beneficial for an interdisciplinary team.

EFFICACY AND SAFETY OF ONCE-WEEKLY ROSUVASTATIN IN PATIENTS WITH PRIOR STATIN INTOLERANCE

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Purpose: To assess the efficacy and safety of once-weekly rosuvastatin therapy in patients with prior documented myalgias to statins that are not currently taking a statin and are not at their low-density lipoprotein (LDL) goal.

Methods: The Veterans Affairs Computerized Patient Record System (CPRS) will be used to identify Milwaukee VA primary care patients with a documented diagnosis of hyperlipidemia and a history of myalgias with one or more statins, who are not currently on statin therapy, and not at LDL goal. A total of 25 patients meeting the inclusion criteria will be randomly selected, with study enrollment pending patient and provider consent. A fasting lipid panel (FLP), liver function tests (LFTs), and CPK will be collected at baseline. Patients will be initiated on 5mg once-weekly rosuvastatin with follow-up at 6 weeks. Patients achieving LDL goal at 6 weeks will continue rosuvastatin 5mg once-weekly with additional follow-up at 12 weeks. Patients not achieving LDL goal at 6 weeks will increase their rosuvastatin dose to 10mg once-weekly with additional follow-up at 12 weeks. Patients achieving LDL goal at 12 weeks will continue their current dose of rosuvastatin with final follow-up at 18 weeks. Patients not achieving LDL goal at 12 weeks will increase their rosuvastatin dose to 15mg once-weekly with final follow-up at 18 weeks. The addition or discontinuation of other lipid-lowering agents will not be permitted during the study period. After 18 weeks, the percentage change in LDL, HDL, total cholesterol, and triglycerides from baseline will be calculated. The percentage of patients achieving LDL goal at the end of the study period will also be calculated. Tolerability will be measured by calculating the percentage of patients completing the study with no reported adverse events to once-weekly rosuvastatin therapy.

Results/Conclusions: Pending project completion. Preliminary results will be presented at the conference.

Learning Objectives:

Discuss the results of studies in the literature that have investigated the use of alternative dose rosuvastatin therapy in patients with prior statin intolerance

Identify patients in your practice that could potentially benefit from a trial of alternative dose rosuvastatin therapy

Self Assessment Questions:

In studies investigating the use of once-weekly rosuvastatin in patients with prior statin intolerance, a majority of the study subjects had a previously documented adverse drug reaction to statins of:
a) elevated liver function tests
b) myalgias
c) gastrointestinal symptoms
d) rhabdomyolysis
e) elevated creatine phosphokinase

List three important considerations when determining if a patient with a history of hyperlipidemia would be an appropriate candidate for a trial of once-weekly rosuvastatin therapy

EVALUATION OF A STANDARDIZED PROTOCOL USING ARGATROBAN OR LEPIRUDIN FOR THE TREATMENT OF HEPARIN-INDUCED THROMBOCYTOPENIA

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Purpose: Heparin-induced thrombocytopenia (HIT) is an immune-mediated phenomenon that results in paradoxical thrombosis when patients are exposed to heparin. A therapy option for HIT consists of direct thrombin inhibitors (DTI), which bear a significant cost and a high potential for error. The objective for this study is to compare patient outcomes after a standardized treatment protocol for HIT was implemented at our institution, to patient outcomes prior to protocol implementation.

Methods: This research protocol has been approved by the Institutional Review Committee. Drug charge data will be used to identify patients that received either argatroban or lepirudin from July 1, 2006 to present. Patients receiving either drug prior to March 31, 2009 (date of standardized protocol approval) will be in the pre-protocol group, and those after will be in the post-protocol group. Patients included must be greater than or equal to 18 years of age and received either drug in question for greater than 24 hours. Those excluded will be patients receiving DTI therapy in the setting of percutaneous coronary intervention (PCI) only or those having an incomplete chart at the time of review. The following data will be collected: age, weight, race, sex, serum creatinine, AST, ALT, alkaline phosphatase, hemoglobin, hematocrit, platelets, aPTT, HIT antibody, number of blood transfusions given, loading dose administered, PT/INR, total bilirubin, admit diagnosis, previous medical history, prior surgeries, prior hospitalizations, drug allergies, prior positive HIT antibody, thrombotic event, necrosis at site of injection. Patient information will be de-identified and maintained confidentially.

Results: Data collection and statistical analysis will be complete by April 2010. Final results will be presented at Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Describe pathophysiology of heparin-induced thrombocytopenia

List treatment options for heparin-induced thrombocytopenia

Self Assessment Questions:

Which of the following most accurately describes the complex responsible for activating platelets in heparin-induced thrombocytopenia?
a.platelet factor 4 (PF4)heparin complex
b.heparinantithrombinthrombin complex
c.platelet factor 4serotonin complex

Which of the following therapies has the strongest recommendation according to the CHEST 2008 Guidelines for the Treatment and Prevention of HIT?
a.Lepirudin
b.Argatroban
c.Fondaparinux
d.Bivalirudin
e.Both a & b

ANTICOAGULATION STABILITY AND CLINIC MANAGEMENT IN AFRICAN AMERICANS ARE NOT AFFECTED BY WORSENING COGNITION

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PURPOSE:
Despite considerable data demonstrating warfarins benefits, it remains underutilized in elderly patients. One barrier identified as a frequent factor in decisions not to anticoagulate is cognitive impairment (CI). However, there is limited data to justify this rationale. Since warfarin-treated patients are most vulnerable to adverse events during the initial anticoagulation period, we sought to determine if CI prolonged the period to therapeutic anticoagulation or was associated with reduced anticoagulation stability versus patients with normal cognitive function (NCF).

METHODS:
We assessed 19 patients (773 years old) whose initial warfarin therapy was managed by a pharmacist-run anticoagulation clinic. Patients were divided based on mini-mental status exam (MMSE) scores (maximum score 30); NCF ≥ 27 (n=8), CI ≤ 26 (n=11). We determined the number of clinic visits and days required to achieve therapeutic anticoagulation; defined as two consecutive in-range international normalized ratio (INR) values. We also assessed anticoagulation stability by; (1) calculating INR standard deviation (SD) - the smaller the SD, the greater the stability; and (2) measuring the percentage of INRs ≥ 4.

RESULTS:
We found no difference in number of visits (NCF= 6.11.5, CI= 5.91.7; p=0.90) or days (NCF= 5616, CI= 7022; p=0.65) required to achieve therapeutic anticoagulation. Furthermore, for CI patients, there was no correlation between MMSE score (range 15-26) and number of visits (p=0.53); consistent with no cognitive impairment-related prolongation of time to therapeutic anticoagulation. INR SD was similar for both groups (NCF= 0.68, CI= 0.62; p=0.96), as were visits with INRs ≥ 4.0 (NCF= 6% vs. CI= 4%; p=1.00).

CONCLUSIONS:
We found cognitive impairment neither delayed the time required to achieve therapeutic anticoagulation, nor decreased anticoagulation stability versus patients with normal cognitive function. Therefore, we propose that cognitive impairment does not appear to be a valid barrier to initiation of anticoagulation in elderly patients attending an anticoagulation clinic.
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Learning Objectives:

Identify the apparent obstacles to warfarin therapy

Discuss how cognitive impairment could influence the obstacles to warfarin treatment

Self Assessment Questions:

True or False: Warfarin decreases the annual risk of stroke by ~ 68%

True or False: About 20% of patients with atrial fibrillation do not receive warfarin when indicated

EVALUATION OF A PHARMACIST-MANAGED EPOETIN ALFA CLINIC IN OUTPATIENTS WITH NON-DIALYSIS DEPENDENT CHRONIC KIDNEY DISEASE

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Purpose: The use of erythropoiesis-stimulating agents is indicated in patients with anemia secondary to chronic kidney disease (CKD) due to impaired production of erythropoietin. Kaiser Permanente Health Plan of Ohio implemented a pharmacist-managed epoetin alfa clinic in May 2008. This study will assess the safety and efficacy of epoetin alfa use in a pharmacist-managed clinic by evaluating adherence to the NKF-KDOQI guidelines and the epoetin alfa package insert. This study will also seek to determine factors of the clinic that are correlated with patient satisfaction.

Methods: This study includes two components: a retrospective chart review and a patient satisfaction survey. Approximately 100 patients managed by usual care will be compared to a randomly matched number of patients enrolled in the pharmacist-managed clinic. Included in this study will be patients who have been on epoetin alfa for at least one year, have a diagnosis of anemia secondary to CKD, and do not require dialysis. The collected data will include: demographics (age, gender, race, history of diabetes mellitus or hypertension, and stage of CKD); hemoglobin, transferrin saturation, and ferritin lab values; frequency of lab parameter monitoring within a 12 month period; if IV iron was administered in accordance with guidelines; the amount of epoetin alfa doses held; and the percentage of time hemoglobin is in therapeutic range. Descriptive statistics will be used to describe demographic and clinical characteristics of the two groups. Chi-square and regression analysis will evaluate the hemoglobin, transferrin saturation, and ferritin values. Patient satisfaction surveys will be mailed to all patients currently enrolled in the clinic. This survey will evaluate knowledge about disease state and satisfaction with staff interaction. Patient demographics will be collected, and survey data will be analyzed using multi-variate regression analysis.

Results and Conclusions: Data collection is currently in progress and results will be presented.

Learning Objectives:

Explain the role of epoetin alfa in anemia secondary to chronic kidney disease.

Recognize the goals of therapy and monitoring parameters established by the NKF-KDOQI guidelines and epoetin alfa package insert.

Self Assessment Questions:

True/False: The goal hemoglobin level for patients with anemia secondary to chronic kidney disease is dependent on their symptoms.

True/False: Iron supplementation can decrease the dose of epoetin alfa needed to achieve a therapeutic hemoglobin level.

DEVELOPING AN ANTIMICROBIAL SURVEILLANCE PROGRAM TO MONITOR CARBAPENEMS AND FLUOROQUINOLONES IN A PEDIATRIC HOSPITAL

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Purpose: Overuse of broad-spectrum antibiotics is known to lead to bacterial resistance. Carbapenems and fluoroquinolones are broad-spectrum antibiotics with limited pediatric indications. The objective of this project is to create a pharmacist-led program to monitor the use of carbapenems and fluoroquinolones with goals of optimizing therapy and decreasing inappropriate use.

Methods: All patients admitted to the hospital will be included in the surveillance. Medication use evaluations (MUEs) will be completed for carbapenems and fluoroquinolones to determine baseline use. New orders for carbapenems and oral or intravenous fluoroquinolones will be evaluated prospectively and concurrently from the pharmacys computer system. Evaluation will include: correct dosing and interval, appropriate indication based on cultures, patient immune status, and patient allergies. Interventions, clarifications, and suggested changes to therapy will be made and documented. Patients determined to be receiving these drugs appropriately (based on hospital-approved criteria) will continue to be monitored daily for culture results, change in organ function that would necessitate dosage change, length of therapy, and any other factors that may change management. Interventions will continue to be made and documented as needed. Repeat MUEs will be completed after a period of interventions to evaluate for improvement in use. Education of pharmacists will also be done to improve awareness and promote the program.

Results: Baseline MUEs were completed on intravenous meropenem and ciprofloxacin and were compared to previous MUEs on these drugs. The baseline MUEs showed that empiric use of both drugs has increased and that use is not appropriate in at least 25% of situations. Other data collection is ongoing and further results will be presented at the conference.

Conclusions: This project is designed to provide an increase in appropriate use of carbapenems and fluoroquinolones in pediatric patients by actively monitoring orders and making interventions.

Learning Objectives:

List the approved pediatric indications for meropenem and ciprofloxacin

Recognize when meropenem and ciprofloxacin are being used appropriately in a pediatric patient

Self Assessment Questions:

In what situations would it be appropriate to use meropenem or ciprofloxacin in a child?

Explain some of the difficulties in developing and maintaining an antimicrobial surveillance program in a pediatric hospital.

IMPACT ON MONITORING OF FASTING LIPID PANEL AND FASTING PLASMA GLUCOSE IN PATIENTS PRESCRIBED SECOND GENERATION ANTIPSYCHOTICS WITH THE IMPLEMENTATION OF AN AMBULATORY PHARMACEUTICAL CARE SERVICE

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Purpose: Second generation antipsychotics (SGA) are associated with metabolic side effects including significant weight gain, impaired fasting glucose, and dyslipidemia. In 2004, consensus guidelines were established by the American Diabetes Association, American Psychiatric Association, American Association of Clinical Endocrinologists, and North American Association for the Study of Obesity for monitoring metabolic risk factors and laboratory values in patients prescribed second generation antipsychotics. Studies have identified poor rates of compliance with laboratory monitoring according to the consensus guidelines, ranging from 10 to 30%. The purpose of our study is to compare compliance rates with laboratory monitoring guidelines at our institution between patients enrolled in a pharmacist-driven ambulatory care service and usual physician-based care.

Methods: This is a three-month prospective pilot study. A collaborative practice agreement has been established between psychiatrists and pharmacists allowing pharmacists to order fasting lipid panels, fasting plasma glucoses, and referrals to educational services if warranted. Study participants were identified for recruitment using Gundersen Lutherans internally reported data on patients who have been prescribed a second SGA and are scheduled to see providers participating in the collaborative practice agreement. Eligible patients were randomized into two groups; one group was recruited for the pharmacy-based ambulatory care service and the second group acted as the control. The control group continued usual medical and psychiatric care. Patients enrolled in the intervention group had a face-to-face appointment with a pharmacist on the same day as they see their psychiatrist. Patients were scheduled for laboratory tests by the pharmacist if needed according to the guidelines. Pharmacists also provided education regarding medications, metabolic side effects and lifestyle changes during the appointments.

Preliminary Results: Laboratory monitoring compliance rates according to the consensus guidelines will be compared between the two groups before and after study intervention. Results will be presented at Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Recognize the metabolic side effects associated with second generation antipsychotics.

Describe the rates of compliance with laboratory monitoring for metabolic side effects in accordance with the established consensus guidelines that have been identified in recent published studies.

Self Assessment Questions:

Which second generation antipsychotic is associated with higher incidence of metabolic side effects?

Recent published studies have found that compliance rates with laboratory monitoring according to the consensus guidelines established in 2004 ranges from what percent?

ADHERENCE TO ACETAMINOPHEN DOSAGE GUIDELINES AND ASSOCIATED OUTCOMES IN HOSPITALIZED PATIENTS WITH CONCOMITANT ALCOHOL ABUSE IN A COMPUTERIZED PHYSICIAN ORDER ENTRY (CPOE) SETTING.

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Purpose
Acetaminophen is commonly used as both an effective pain reliever and antipyretic. There are many products that exist on hospital formularies that contain acetaminophen alone or in combination which can lead to patients receiving total daily dosages exceeding the recommended 4 grams per day maximum.
This study will determine the number of events where high-risk patients received more than 4 grams of acetaminophen in a 24-hour period. The study will examine the use and outcomes of acetaminophen usage at Saint Marys and will provide data to support a change in medication use processes if indicated.

Methods:
This study is a retrospective chart review using a convenience sample of all patients admitted under the diagnosis code for continuous alcohol abuse from 11/01/2008 to 10/31/2009 with an order for at least one acetaminophen containing product. Acetaminophen data includes total amount possible, based on patient specific order, and total amount administered in each 24 hour period. Baseline (admission) and subsequent liver function testing is also being collected. The primary endpoint will evaluate overall adherence to acetaminophen dosing guidelines (less than 4 grams per day) during the specified time period and will be assessed using a Chi-squared test. The secondary endpoint will examine changes in liver function tests in patients who received greater than 4 grams of acetaminophen in at least one 24 hour period and will be assessed using a student t test. In these patients concomitant usage of other hepatotoxic medications will be evaluated.
A relationship between doses of acetaminophen as it correlates with liver dysfunction across all doses of acetaminophen in these patients will also be assessed.

Results:
Data collection for this research is ongoing at submission deadline.

Conclusions:
To be presented pending data review and analysis.

Learning Objectives:

1.Describe the metabolic pathways used for the elimination of acetaminophen and the mechanism of acetaminophen induced liver toxicity.

2.Explain the use and safety of acetaminophen in chronic alcohol patients.

Self Assessment Questions:

1.What percentage of acetaminophen is converted to the reactive metabolite N-acetyl-para-benzoquinoneimine (NAPQ1)?
a.25%
b.15%
c.5%
d.1%

2.True/Flase - Randomized controlled trials have shown that the use of acetaminophen in alcoholic patients at less than 4 grams per day is more likely to produce clinically significant hepatotoxicity.

IMPACT OF PROTON PUMP INHIBITORS ON THE CLINICAL EFFICACY OF CLOPIDOGREL IN SECONDARY STROKE PREVENTION

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Guidelines recommend clopidogrel as an acceptable first line agent for secondary stroke prevention. The FDA recently announced an ongoing safety review of clopidogrel due to published trials that demonstrated lack of efficacy in patients with genetic differences and using medications that inhibit the metabolism of clopidogrel. The objective of this multicenter, retrospective, cohort analysis is to determine if proton pump inhibitors (PPI) decrease the clinical efficacy of clopidogrel in secondary stroke prevention. Secondary objectives will be to assess influence of specific PPI and assess patterns of prescribing PPI with clopidogrel.

This study was approved by University of Kentucky Institutional Review Board and Veterans Affairs Research and Development Committee. The Veterans Integrated Service Network (VISN) 9 data warehouse will be used to identify patients admitted with ischemic stroke or transient ischemic attack from January 1, 1998 to December 1, 2007 receiving clopidogrel therapy for secondary prevention. Subjects will be included if they are between 18 and 89 years old, prescribed clopidogrel for the first time within 30 days of qualifying event, and have filled clopidogrel prescription consistently for 24 months (>657 days). Subjects will be excluded if they had an ischemic stroke or transient ischemic attack in the previous 6 months prior to their qualifying event, a clopidogrel prescription in the previous 90 days of the qualifying event, or those non-adherent to clopidogrel defined as a medication possession ratio (MPR) of less than 0.8. Subjects will be observed for 2 years following the qualifying event for the primary endpoint of ischemic stroke/TIA. Baseline demographics, comorbidities, and medications will be extracted electronically. The association of (PPI) use with the primary endpoint will be determined using logistic regression. Variables that may contribute to recurrent stroke will be controlled by utilizing covariate matching.

Results and conclusion pending data collection and analysis.

Learning Objectives:

Discuss the purposed mechanism of action of the drug interaction between clopidogrel and proton pump inhibitors.

Recognize multiple variables that impact the risk of ischemic stroke and transient ischemic attack.

Self Assessment Questions:

Which of the following is the purposed mechanism of the interaction between proton pump inhibitors and clopidogrel?

True or False: Many variables must be taken into account when assessing risk for ischemic stroke or transient ischemic attack.

THE EFFECT OF INAPPROPRIATE VITAMIN K USE FOR MANAGEMENT OF ELEVATED INTERNATIONAL NORMALIZED RATIOS ON HOSPITAL LENGTH OF STAY

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Purpose: Phytonadione, commonly known as vitamin K, is an essential factor for the coagulation cascade. Vitamin K is commercially available as an emulsion injection and oral formulation. The most common indication for prescribing vitamin K is reversal of a supratherapeutic international normalized ratio (INR) due to excessive anticoagulation with warfarin. The CHEST guidelines provide recommendations for the management of a supratherapeutic INR regardless of bleeding. Recommendations include, but are not limited to, omitting a warfarin dose and/or administering vitamin K. Currently there is no literature describing the impact of inappropriate vitamin K use on hospital length of stay (LOS).

Methods: This retrospective chart review evaluated adult patients admitted to Methodist Hospital in Indianapolis, IN between July 1, 2008 and June 30, 2009. Patients were included if the following criteria was met: at least 18 years of age and received therapy for reversal of a supratherapeutic INR according to the CHEST guidelines. Therapy for reversal of a supratherapeutic INR was defined as discontinuation of warfarin or administration of vitamin K. Patients were excluded with a diagnosis of a coagulopathy unrelated to warfarin use, or if warfarin was not re-initiated during hospitalization. The primary objective is to determine if the inappropriate use of vitamin K for the reversal of supratherapeutic INR prolongs LOS. Secondary objectives include the assessment of adherence to the CHEST guidelines for vitamin K prescribing, and to evaluate the time to achieve a therapeutic INR when re-initiating warfarin.

Results and Conclusion: Data collection is currently in process and will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Summarize the 2008 CHEST recommendations for the management of supratherapeutic INRs in patients receiving warfarin.

Identify appropriate routes of vitamin K administration.

Self Assessment Questions:

All of the following are recommended by the CHEST 2008 guidelines for an INR of 5.9 with no significant bleeding present EXCEPT:

a)Omit next 1-2 doses of warfarin, monitor frequently, resume at lower dose when INR is in therapeutic range

b)Omit next dose of warfarin and give vitamin K 1-2.5 mg by mouth if at increased risk of bleeding

c)Hold warfarin and give vitamin K 5 mg intravenously

d)Vitamin K 5 mg by mouth if patient requires urgent surgery

True or False. The preferred route of vitamin K administration is oral.

IMPLEMENTING A VERIFYNOW AND TEG GUIDED TRANSFUSION ALGORITHM IN CARDIOVASCULAR SURGERY

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Purpose: The primary objective of this project is to facilitate the appropriate use of blood products and reduce factor VII requirements by implementing a peri-operative treatment algorithm. The algorithm utilizes point of care testing to assess platelet function and direct appropriate blood product selection in cardiovascular surgery.

Methods: This project will use the previous years cardiovascular surgery department blood and factor VII usage as baseline for comparison. Peri-operative treatment algorithms were developed, approved by the Aurora Health Care Blood Charter Group, and implemented prior to the start of data collection. The authors are utilizing chart reviews, point of care test results, and the Society of Thoracic Surgeons (STS) Cardiac Database for data collection. All data will compiled and analyzed to determine the effect of the implemented algorithms on blood product utilization in cardiovascular surgery as compared to baseline.

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

Learning Objectives:

Understand how pre-operative administration of antiplatelet medications can affect outcomes of cardiovascular surgery.

Identify how a point of care test directed algorithms could impact blood product administration in cardiovascular surgery patients.

Self Assessment Questions:

What are two reasons for interpatient response variability to clopidogrel?

In what way do VerifyNowP2Y12 and Thromboelastography (TEG) assess patient hemostasis?

IMPACT OF PHARMACIST MEDICATION RECONCILIATION UPON DISCHARGE OF PATIENTS WITH DIAGNOSED ACUTE MYOCARDIAL INFARCTION

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Purpose:
To evaluate the benefit of pharmacist interventions in the medication reconciliation discharge process, while assessing acute myocardial infarction (AMI) core measure adherence.

Methods:
A retrospective analysis was conducted on AMI patients identified by ICD-9 code from a previous quarter. The rate of medication discrepancies per patient discharge instructions and AMI core measure adherence was reviewed. A prospective cohort study using a convenience sample over a two month period included patients diagnosed with a myocardial infarction during their hospital stay in addition to an elevated troponin level. Patient medications were reviewed by the pharmacist and recommendations were made to the physician responsible for reconciling medications at discharge. The primary outcome of this study was to evaluate the impact of a pharmacist on the rate of discrepancies per discharge instruction form. The secondary outcome was to assess adherence to AMI core measures 2, 3, and 5.

Results:
A total of 108 patients were included in the retrospective analysis. The total amount of discrepancies found was 304, with a calculated rate of 2.8 discrepancies per patient medication discharge instructions. The majority of discrepancies were categorized as prescription based, 89.1%. The most frequent prescription based discrepancies was due to an incomplete or unclear prescription instruction; (132 / 211), 62.6%. Thirty-three pharmacotherapy based discrepancies were found, 10.9%. The most frequent pharmacotherapy based discrepancy was categorized as a therapeutic omission, 39.4%. The secondary outcome for the retrospective portion of this study found 92.6% adherence to AMI core measure 2; 89.0% adherence to core measure 3; 97.2% adherence to core measure 5. An interim analysis of 10 prospective patients revealed a rate of 2.4 discrepancies per patient medication discharge instructions.

Conclusion:
Final results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference

Learning Objectives:

Describe the impact of pharmacists on the medication reconciliation process

Recognize the importance of core measures in obtaining standardized care for AMI patients

Self Assessment Questions:

True / False: Medication reconciliation is an important hospital process that requires multidisciplinary cooperation

Which of the following medications would not be required by the core measures to be prescribed to an AMI patient at discharge? A. aspirin, B. lisinopril, C. amlodipine, D. metoprolol

COMPARISON OF ZOSTAVAX EDUCATIONAL METHODS AND THEIR EFFECTS ON VACCINATION RATES

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Purpose: To compare active versus passive educational methods on ZOSTAVAX vaccination rates in a community pharmacy.
Methods: The research will be conducted at an independent pharmacy in Westerville, Ohio. Prior to the study, pharmacist investigators will complete an Ohio Pharmacists Foundation continuing education program about herpes zoster. Study subjects will include pharmacy patients ≥ sixty years identified from the pharmacys electronic records. After consent, pharmacists will verbally administer a patient survey to participants in phase one to assess baseline knowledge of ZOSTAVAX and educate them on indications for the vaccine. One month later, these patients will be contacted by telephone to complete a post-intervention survey to determine 1) if they received ZOSTAVAX, 2) who administered the vaccine, 3) what encouraged them to receive the vaccine, and 4) what barriers they encountered to receiving ZOSTAVAX. Within the next two months, signage advertising ZOSTAVAX availability will be placed in the pharmacy. Additional subjects will be recruited from a convenience sample of patients who meet the inclusion criteria and receive ZOSTAVAX at the pharmacy. They will be surveyed using a similar post-vaccination instrument as used in Phase 1. Patients from the educational intervention in Phase 1 will be excluded from Phase 2. Patient demographics will also be collected.
Results: The primary outcome is the comparison of frequencies of vaccination in each phase to determine which method of patient education/marketing resulted in greater vaccination rates. Secondary outcomes will include a cost-effectiveness analysis by method (eg. cost of pharmacist time versus cost of signage) and the most frequently cited barriers to ZOSTAVAX.
Implications: Pharmacists are among the most accessible healthcare providers, and are legally able to provide important vaccinations. The results of this study will provide data on the best methods to effectively educate patients and increase ZOSTAVAX vaccination rates in appropriate patient populations.ulatio

Learning Objectives:

Identify whether or not active or passive pharmacist educational methods will be the most effective in increasing ZOSTAVAX vaccination rates.

Identify the most cost effective educational method.

Self Assessment Questions:

True or False. ZOSTAVAX has been found to reduce the risk of developing herpes zoster by greater than 50%.

True or False. Pharmacists in the state of Ohio administer ZOSTAVAX without a prescription.

OUTCOMES ASSOCIATED WITH IMPLEMENTATION OF EXTENDED-INFUSION PIPERACILLIN/TAZOBACTAM IN A COMMUNITY HOSPITAL

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PURPOSE
Due to developing resistance of current antibiotics, decreasing novel therapies within infectious diseases, and mortality associated with gram negative infections, there has been a re-evaluation of administration techniques used with currently available antibiotics. Piperacillin/tazobactam is a beta lactam antibiotic often used in the treatment of gram negative infections. Recent evidence suggests extending the infusion time, while decreasing the frequency and amount of daily drug, not only decreases drug cost, but may also increase efficacy. The objective of this study was to characterize the clinical effect of extended infusion piperacillin/tazobactam against gram negative infections versus alternative therapy with traditional intermittent infusions of piperacillin/tazobactam.

METHODS
A retrospective chart review was conducted to evaluate patients treated with extended-infusion piperacillin/tazobactam 3.375 grams every 8 hours infused over 4 hours from 9/17/2009 to 11/30/2009 compared to patients treated with intermittent infusion of any dose or frequency of piperacillin/tazobactam from 1/16/2009 to 7/16/2009. All patients were included unless estimated creatinine clearance was < 20 ml/min, less than 18 years old, and doses administered in the emergency department. Demographic information collected included: age, height, weight, serum creatinine, and comorbid conditions. Source of positive culture, infectious organism, and minimum inhibitory concentration (MIC) data, if available, were documented as well as mortality data, hospital length of stay, length of stay in intensive care unit, study drug duration and number of doses received, hospital readmission rate, and concurrent antibiotics. Additionally, a cost analysis was performed. The primary endpoint was total duration of antibiotic therapy and the secondary endpoints were intensive care unit length of stay, readmission rate, and mortality.

RESULTS/CONCLUSION
To be presented at Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Describe the rationale for optimizing the pharmacokinetics of piperacillin/tazobactam by extending the infusion time.

Be able to identify patients who are not only eligible to receive extended infusion piperacillin/tazobactam, but can also benefit from a potential improvement in the effectiveness of the drug.

Self Assessment Questions:

True or False: As a result of the concentration-dependent pharmacokinetics of piperacillin/tazobactam, its effect is determined by the amount of free drug available at concentrations above the MIC

True or False: Implementing a standard extended-infusion dose and frequency of piperacillin/tazobactam eliminates the need for pharmacists to evaluate the appropriateness of therapy once a clinician orders piperacillin/tazobactam.

REVIEW OF STRESS ULCER PROPHYLAXIS INITIATION AND DAILY ASSESSMENT IN THE COMMUNITY HOSPITAL INTENSIVE CARE UNIT SETTING.

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PURPOSE: Medications utilized for gastric acid suppression have been associated with adverse events (pneumonia and Clostridium difficile infection). Prolonged use outside of the critical care unit adds to the medication-related problem of drug use without an indication. With limited resources, the intensive care unit team should be responsible for daily assessment of appropriateness of stress ulcer prophylaxis, with removal of said therapy when it is no longer warranted. We aim to evaluate the appropriateness of stress ulcer prophylaxis on initiation and for the duration of the patients stay in the community hospital intensive care unit setting.
METHODS: This is a six month, prospective observation evaluating the prophylaxis for stress ulceration in critically ill patients in our institution. Patients were identified through the hospitals pharmacy computer system. Inclusion criteria included adult patients that received either a histamine-2 receptor antagonist or proton-pump inhibitor for stress ulcer prophylaxis during a three month time period before and after an update to the nursing daily goal sheet. Exclusion criteria included use of study agents prior to hospitalization, active gastrointestinal bleed, or length of intensive care unit stay less than or equal to 48 hours. The daily patient goal sheet was updated with risk factors for stress related mucosal disease and education was provided to ensure the nursing staff had the tools necessary for a nursing driven daily assessment of the appropriateness of stress ulcer prophylaxis. A sample population of 250 patients was randomly selected for analysis. Patient specific risk factors for stress related mucosal disease and stress ulcer prophylaxis prescribing habits were recorded. Descriptive and comparative statistics will be used in reporting of data
RESULTS/CONCLUSION: Data collection is ongoing, with results and conclusions at the conference.

Learning Objectives:

Discuss the adverse events that have been associated with the medications utilized for stress ulcer prophylaxis.

Identify risk factors associated with stress related mucosal disease in the intensive care unit setting.

Self Assessment Questions:

What adverse events have been associated with the medications utilized for stress ulcer prophylaxis?
a.)Pneumonia
b.)Drug use without indication
c.)Clostridium difficile infection
d.)All of the above

Self Assessment Question 2:
Which risk factor is an independent risk factor for stress related mucosal disease requiring prophylaxis in the intensive care unit setting?
a.)Mechanical ventilation > 48 hours
b.)High dose steroid utilization (≥250mg of hydrocortisone or equivalent per 24 hours)
c.)Sepsis
d.)Extended ICU stay (>7 days)

DEVELOPING A MODEL TO ADVANCE CLINICAL SERVICES IN THE COMMUNITY PHARMACY SETTING WITH A FOCUS ON HYPERTENSION MANAGMENT

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Purpose: Seventy-three million American adults, about one in every three adults, have hypertension (HTN). It is estimated that the indirect and direct costs of HTN in the year 2009 will amount to around 74 billion dollars. Studies have shown that blood pressure monitoring and education by a pharmacist in the community setting can improve HTN outcomes. The University of Wisconsin Hospital and Clinics (UWHC) has 15 community pharmacies, all of which are adequately equipped to provide clinical services. The objectives of this study are to evaluate the current model for delivering blood pressure monitoring to patients in the community setting at one of the UWHC's community pharmacies, University of Wisconsin (UW) Health Pharmacy Services at Hilldale, and to develop a plan to expand the program to other community pharmacies at the UW.

Methods: A literature search concerning past blood pressure monitoring programs will be performed. Other community pharmacy based blood pressure monitoring programs will be examined to collect data and make comparisons with the current program at UW Health Pharmacy Services at Hilldale. UW Health Pharmacists participating in the blood pressure monitoring program will be surveyed to assess barriers to the current program. The current program will be revised based on results from this survey and a standardized procedure for completion and documentation for each monitoring visit will be implemented at the Hilldale location. Pharmacists from other UW Health Pharmacy sites will be surveyed to assess interest and willingness to implement the same blood pressure monitoring program at their primary practice location. Based upon the survey results, additional sites will be selected for implementation of the blood pressure monitoring program. An educational training program for pharmacists and technicians will be created and conducted at the selected sites prior to the commencement of the program at each respective location.

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

Learning Objectives:

Describe the impact pharmacists can have on blood pressure control.

Discuss the factors that need to be addressed before implementing a new program in the community setting.

Self Assessment Questions:

T/F Community Pharmacy based blood pressure monitoring programs have proven to have a positive impact on patient blood pressure control.

What are potential barriers to the successful development and growth of a community pharmacy based blood pressure monitoring program?

EVALUATION OF PHARMACISTS' USE OF ONLINE SOCIAL NETWORKING MEDIA

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Purpose: Social networking through an online medium has greatly increased in popularity over the last few years. Currently, Facebook© boasts over 300 million active users, in which the fast growing demographic is individuals over age 35. The objective of this study is to describe the use of online social networking tools by pharmacy professionals and determine the potential role this type of media could serve in professional networking and continuing education.
Methods: A 27-question survey was developed to collect information regarding participant demographics; use patterns of online social networking sites (i.e. Facebook© and Twitter™); the willingness to use these sites to obtain information such as pharmacy news, drug/disease state information and/or career opportunities; and the types of organization(s) from which pharmacists are willing to receive this information. An invitation to participate and a link to the anonymous, web-based survey was e-mailed to 310 Purdue University School of Pharmacy Advanced Clerkship Preceptors in March 2010. This project was approved by the local Investigational Review Board with exempt status from regulations for the protection of human subject research.
Results: One hundred and seven individuals have responded to the survey as of March 30th. The average age of respondents is 41 years. Most of the respondents hold PharmD degrees and are employed in hospital pharmacy. Of the respondents who have Facebook© accounts, 91% use these sites for social purposes. Half of the respondents were interested in receiving continuing education information through these sites; however, the majority of respondents were not interested in receiving drug/disease state or career opportunity information.
Conclusion: Preliminary results indicate social media is extensively used by pharmacy professionals for the purpose of social networking. However, pharmacists appear to be apprehensive about using these sites for professional development. Final results will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Describe the recent growth of online social networking media and how it affects pharmacists.

Identify how pharmacists currently use online social networking media and whether they would be willing to use these sites for professional networking and continuing education.

Self Assessment Questions:

True or False: Online networking sites such as Facebook add over 100,000 users every week.

True or False: Pharmacists are likely to pursue career opportunities on Facebook.

VINCRISTINE DOSE MODIFICATION DURING CONCOMITANT USE OF FLUCONAZOLE IN PEDIATRIC CANCER PATIENTS

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Purpose:
Vincristine is an antineoplastic, vinca alkaloid that is used in the treatment of pediatric acute lymphoblastic leukemia (ALL). Vincristine causes cell death by inhibiting microtubule formation in the mitotic spindle, which is also responsible for the neurologic toxicities seen in patients due to the structural changes in the axon of nerve cells. Vincristine is hepatically metabolized and a major substrate of the CYP3A4 enzyme system. The azole antifungals are known inhibitors of the CYP3A4 enzyme, which could lead to increased levels of vincristine and possibly, profound toxicity for the patient. Published case reports have described neurologic toxicities associated with concomitant administration of itraconazole (for fungal prophylaxis) and vincristine in pediatric cancer patients. However, the use of fluconazole and its potential drug interaction with vincristine has not been studied or reported in the literature. This study has been designed to evaluate the safety of concomitant fluconazole and vincristine administration in pediatric ALL patients.

Methods:
The study will be conducted by a non-interventional, retrospective chart review utilizing the electronic medical record. Patients will be included if they meet the following criteria: diagnosis of ALL, ages 1-18, and receiving combination therapy with vincristine and fluconazole during induction chemotherapy. Patients will be excluded if they were receiving a different azole for antifungal treatment or prophylaxis, receiving a potent inhibitor or inducer of CYP3A4, or received induction chemotherapy at an outside hospital. The following data will be collected from the patients medical record: age, gender, height, weight, disease risk stratification, chemotherapy and antifungal prophylaxis doses/frequencies/dates/dose adjustments, CYP3A4 interacting drugs, autonomic and peripheral neurotoxicities, and sodium/creatinine/bilirubin levels. Study data will be analyzed using a Microsoft Access database. The treatment group and historical control group will be compared utilizing appropriate statistical tests for the pre-specified outcome.

Results/Conclusions: To be determined - data collection in process.

Learning Objectives:

Explain current infection prophylaxis in pediatric acute lymphoblastic leukemia (ALL) patients

Discuss the drug interaction between vincristine and fluconazole to identify the potential complications for patients receiving concomitant therapy

Self Assessment Questions:

(T or F) The Childrens Oncology Group (COG) advises providers to use caution when administering azole antifungals to patients receiving vincristine due to the risk for greater neurotoxicity.

The mechanism of action for azole antifungals is:
a.Inhibit 14-α-demethylase to decrease ergosterol synthesis
b.Inhibit 1,3-beta-D-glucan synthase to decrease glucan synthesis
c.Bind to ergosterol to alter cell membrane permeability
d.Penetrate into fungal cells to interfere with fungal RNA and protein synthesis

EVALUATION OF A NEW MODEL OF CARE FOR TOBACCO CESSATION IN A VETERAN POPULATION

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Purpose:
Accounting for over 435,000 deaths each year in the United States alone, smoking has been documented as the number one cause of preventable death. Many studies have documented a correlation between smoking and the development of numerous negative outcomes which can increase the burden on the healthcare system. As the veteran population is more likely to smoke than nonveterans, this burden is realized in the VA healthcare system. Therefore, in an effort to improve outcomes and patient care, the William S. Middleton VA has modified their tobacco cessation clinic model to include both a group and telephone clinic. The purpose of this study is to examine the efficacy of the current tobacco cessation clinic model and compare it to both the historical clinic model and primary care physicians.

Methods:
This study is a retrospective chart review which will include patients prescribed tobacco cessation medications by providers at the William S. Middleton VA Hospital between September 1, 2008 and November 30, 2008 and patients receiving medications through the Tobacco Cessation Clinic between September 1, 2009 to November 30, 2009. Patients were excluded from the study if they were prescribed bupropion solely for mental health conditions or if they only received counseling without any prescription for tobacco cessation medications. Data was collected from the patient data base using the Veterans Affairs Computerized Patient Record System (CPRS) and will include age, gender, tobacco cessation medications, date tobacco cessation medication was prescribed, type of provider prescribing these medications, duration of therapy, successful quit attempt documented 3 to 12 months post-quit date, method of referral, and clinic drop-out rates. Descriptive statistics will be utilized to analyze the sample data.

Results/Conclusion:
Results and conclusion are pending for this study.

Learning Objectives:

Recognize the importance of tobacco cessation in the veteran population.

Recall the potential disease related complications associated with tobacco use.

Self Assessment Questions:

True/False: Tobacco use is the number two cause of preventable death in the United States.

Tobacco use has been associated with which of the following complications?
a.Coronary Heart Disease
b.Stroke
c.Cancer
d.Chronic Obstructive Pulmonary Disease
e.All of the above

IMPACT OF A CLINICAL PHARMACIST ON BLOOD GLUCOSE CONTROL IN THE INTENSIVE CARE UNIT

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Purpose:
Hyperglycemia is associated with increased morbidity and mortality, increased risk of infection, and decreased healing capacity. The impact of a clinical pharmacist on blood glucose control in the intensive care unit (ICU) has not been investigated. This study will determine how a clinical pharmacist rounding with the multidisciplinary team impacts blood glucose control.

Methods:
The primary outcome of this retrospective chart review is the percent of ICU patients with > 80% blood glucose results > 140 mg/dL during a 24 hour period. Blood glucose results for patients admitted to the ICU from January 1 through March 31, 2009 were collected to establish baseline data. A pharmacist participated in daily multidisciplinary rounds September 1 through November 30, 2009. Follow-up blood glucose results are being collected and compared to baseline data. The two groups will be analyzed using the Chi square test. Based on a power of 80% and alpha of 0.05, a sample size of 136 per group is required to detect a 15% difference. Patients < 18 years of age or admitted for diabetic ketoacidosis are excluded. Secondary outcomes include the duration of hyperglycemia and percent of patients with hypoglycemia (blood glucose < 60 mg/dL).

Preliminary Results:
Before a clinical pharmacist on ICU rounds, 42% (57/136) of patients had at least one 24 hour period of > 80% blood glucose results > 140 mg/dL. Approximately half (31/57) of these patients had > 48 hours of > 80% blood glucose results > 140 mg/dL. Hypoglycemia occurred in 10% (13/136) of the patients. Follow-up blood glucose results with a clinical pharmacist and statistical analysis will be presented at the 2010 Great Lakes Pharmacy Resident Conference.

Conclusions:
The impact of a clinical pharmacist on blood glucose control in the ICU is being determined.

Learning Objectives:

Discuss the impact of poor blood glucose control on morbidity and mortality in the intensive care unit.

Describe the impact of a clinical pharmacist on blood glucose control in the intensive care unit.

Self Assessment Questions:

True or False: Hyperglycemia is associated with decreased morbidity and mortality when compared to patients with normal blood glucose levels.

True or False: According to the 2009 American Diabetes Association and American College of Clinical Endocrinologists recommendations for blood glucose control in the intensive care unit, the goal blood glucose range is 180 - 210 mg/dL.

COMPARISON OF PHARMACOKINETIC DOSING METHODS USED FOR AMINOGLYCOSIDES AND VANCOMYCIN

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PURPOSE: Hospital pharmacists dose vancomycin and aminoglycosides through a variety of methods including weight-based and computer-modeled dosing. A pharmacy designed computer based program is currently in use at Cabell Huntington Hospital (CHH). Due to its incompatibility with our new hardware system, it is unable to be maintained. This study will compare actual versus predicted drug levels for vancomycin, tobramycin, and gentamicin through various methods to determine which methods prediction is most similar to the result obtained from the laboratory at CHH. Moreover, this study will help to identify a program for use at CHH.

METHODS: This study protocol has been approved by the IRB with a waiver of consent obtained. Three methods to determine pharmacokinetic dosing were chosen and compared with the current system at CHH. The three methods are as follows:

1.Globalrph.com, a pharmacy website that provides dosing calculators
2.Rx Kinetics, a computer-based pharmacy dosing program
3.Standard pharmacokinetic equations

Predicted peak and trough levels from the different kinetics programs will be documented on a data collection worksheet. After the results are obtained, a comparison of predicted with actual will be made. Additionally, if dose adjustments are needed, they will be made using the program currently in use. The adjusted dose will be evaluated through the other methods and predicted values will be compared to actual values. Retrospective and prospective data will be collected for a total of 240 patients. Benefits of this study include the determination of the dosing method that provides results that are both accurate and precise. Secondary analysis of the methods includes ease-of-use and cost.

RESULTS AND CONCLUSIONS: Data collection is in process. Final results with conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Discuss the accuracy and precision of the various dosing methods used for vancomycin and aminoglycosides.

Identify patient specific parameters which make it difficult to accurately predict peak and/or trough levels.

Self Assessment Questions:

What were the pharmacokinetic methods used for comparison in this study?

With respect to cost and ease-of-use, which of the compared methods was superior?

IMPROVING RATES OF APPROPRIATE MONITORING OF PATIENTS ON AMIODARONE USING A PATIENT DATABASE.

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Purpose: Amiodarone is a widely prescribed antiarrhythmic used to treat a variety of arrhythmias, including ventricular fibrillation (VF), ventricular tachycardia (VT), and atrial fibrillation (AF). Unfortunately, amiodarone has several potentially life-threatening toxicities associated with its use, such as pulmonary toxicity, liver failure, hypotension, ocular problems, hyper/hypothyroidism, and heart failure. Incidence of amiodarone toxicity in the literature varies greatly, ranging anywhere from 15-93% during the course of therapy. In addition, amiodarone can result in serious drug interactions with many commonly prescribed medications.

Methods: The goal of this project is to increase appropriate amiodarone monitoring rates, according to PBM guidelines, through creation of a patient database. Patients will be included if they have a primary care provider (PCP) or cardiology appointment scheduled no later than April 1st, 2010. The database will include dates of previous applicable tests and labs used to monitor for amiodarone toxicity, amiodarone start date, and whether or not patients are concurrently on interacting drugs. For all patients who have a scheduled PCP visit prior to April 1st, 2010, and are currently delinquent on necessary labs by the appointment date, a letter will be sent to the prescribing physician to encourage them to order the necessary labs/tests on the same day as the patient's appointment. The primary endpoint of this project is the percent change in rate of adherence to amiodarone monitoring. Secondary endpoints include number of discontinuations of amiodarone therapy based on development of adverse effects, percent acceptance of pharmacy recommendations, and percent adherence to appropriate baseline monitoring on new starts. Acceptance of pharmacy intervention will be based on if the provider orders the required labs/tests or adjusts doses of amiodarone based on significant drug interactions identified.

Results: Results will be compiled in April 2010 and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

List the potential toxicities associated with amiodarone use.

Describe PBM guideline-recommended monitoring for patients taking amiodarone

Self Assessment Questions:

What labs/tests are recommended every 6 months for patients on amiodarone?

Which of the following is a significant drug-drug interaction with amiodarone?
a)Metoprolol
b)Digoxin
c)Fentanyl
d)Simvastatin
e)All of the above

RETURN ON INVESTMENT OF PHARMACY CLINICAL SURVEILLANCE SOFTWARE IMPLEMENTATION

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Purpose: Clinical surveillance software (CSS) is purported to enhance the ability of pharmacists to provide safe and effective patient care. The primary objective of this study is to determine the return on investment of the implementation of clinical surveillance and documentation programs. The secondary objective is to assess pharmacist satisfaction with their ability to identify and document clinical interventions pre- and post-implementation.

Methods: A CSS program that surveys patient demographic, laboratory and medication information to generate real-time intervention opportunity reports for pharmacists was implemented at a 500-bed community teaching hospital. Prior to implementation of the CSS, a complementary documentation program was implemented to gather baseline data and facilitate analysis of interventions. Analysis included categorization of each clinical intervention and determination of associated cost avoidance as calculated by software-provided estimates based on intervention types. Following baseline data collection, CSS was implemented to assist in cost avoidance and patient safety initiatives. Return on investment will be measured using cost avoidance and rate of targeted pharmacist intervention. A survey will be used to compare pharmacist satisfaction and estimated work time allocation pre- and post-implementation.

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

Learning Objectives:

Describe the differences between the terms "cost avoidance" and "cost savings".

List the potential applications of clinical surveillance software.

Self Assessment Questions:

True or False: It is always possible to directly measure cost avoidance associated with a particular intervention.

Clinical surveillance software can assist pharmacists in the identification of intervention opportunities in which of the following situations:
A) A patient on intravenous medication therapy that could potentially be converted to oral therapy
B) A patient receiving a drug dose that is inappropriate for renal function
C) A culture and susceptibility result indicating resistance to current antibiotic therapy
D) A patient receiving a high-cost drug not in accordance with published guidelines
E) All of the above are possible uses of the software

EVALUATION AND IMPLEMENTATION OF PIPERACILLIN/TAZOBACTAM EXTENDED-INFUSION DOSING AT AURORA HEALTH CARE

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Purpose: The lack of new antimicrobials in development with activity against Pseudomonas and other bacteria has lead to the manipulation of conventional dosing strategies in order to maximize the drugs pharmacokinetic and pharmacodynamic effects. Several investigators suggest that piperacillin/tazobactam (P/T) displays non-linear pharmacokinetics, indicating that as more of the drug is administered, the elimination is slower resulting in a longer half-life. Prolonged infusions of beta-lactams have been shown to achieve drug serum levels above common minimum inhibitory concentrations (MICs) for a longer duration of time compared to traditional dosing strategies. Extended infusions also have the potential for cost savings by reducing the number of daily administrations. The primary objective of this project is to evaluate and initiate an extended infusion P/T dosing protocol for the Aurora Health Care System.

Methods: This project was initially submitted to the institutional review board and deemed exempt from oversight since the intent of this project is not human research. A thorough literature search and evaluation has been completed. Microbiology laboratory data, including P/T MIC trends for Pseudomonas were analyzed. Such data was used to appropriately determine the optimal course of action for extended interval infusions. Pharmacy purchasing data and Defined Daily Dose data for P/T was also collected to determine if there is potential for total drug use reduction. Based on data collected, a P/T dosing protocol was developed. Pharmacists, physicians, and nurses were educated accordingly and an educational toolkit was developed. Appropriate evaluation and follow up will occur post implementation and changes will be addressed as necessary.

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

Learning Objectives:

Describe the pharmacodynamic principles behind using P/T as an extended infusion.

Identify two potential benefits of using an extended P/T infusion.

Self Assessment Questions:

What are two benefits of using an extended P/T infusion regimen?

T or F Piperacillin/Tazobactam is a time dependent antibiotic that works best when > 50% of the dosing interval is spent above the minimum inhibitory concentration (MIC)?

THE OPPORTUNITY FOR PHARMACY INTERVENTION ON AN URBAN TEACHING HOSPITAL RAPID RESPONSE TEAM

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Purpose: The role of the rapid response team is to bring the expertise of the critical care nurse specialist to a patient who has met a pre-determined criteria for deterioration within the hospital general practice unit and treat accordingly. The rapid response team has been found to reduce the number of code related mortalities, as well as increase the number of blue alert patients that are discharged alive. Currently, the role of a pharmacist on the rapid response team is undefined. The goal of this study was to identify the role of the pharmacist on the rapid response team and opportunities for pharmacy interventions.
Methods: The pharmacist assisted the rapid response team with evaluation of patients, per current standards of practice. When the rapid response team was not attending patients the pharmacist utilized the PharmDoc system and the Worx order entry program to identify patients enrolled in the CIWA protocol, serum glucose < 60 mg/dl or on hydromorphone ≥4 mg, in an attempt to prevent potential medication errors from occuring.
Results: The pharmacist attended 35 consultations and 11 blue alerts. There were 68 interventions made during 55 consultations, 1.23 interventions per consultation. Twelve interventions were made during 11 blue alerts, 1.1 interventions per blue alert. The most common interventions were dosing recommendations (33%), specific treatment recommendations (18%), and drug information (18%). In both the treatment and dosing categories, antibiotic recommendations were the most common, 25% of the treatment interventions and 18% of dosing. Other interventions included staff education (15%), discontinuation of treatments (6%), obtaining stat medications (6%) and providing laboratory values (4%).
Conclusion: The pharmacist member of the rapid response team has the opportunity for intervention on every patient. The most common areas for intervention were treatment and dosing recommendations of antibiotics and providing drug information to hospital staff.

Learning Objectives:

Define the rapid response team and the significance of its role in the hospital setting.

Describe a technique for implementing a pharmacy program on the rapid response team.

Self Assessment Questions:

Is there an opportunity for the pharmacist to make interventions on the rapid response team?

What are the most common interventions a pharmacist can make while assisting the rapid response team?

IMPLEMENTATION OF AN ARGATROBAN DOSING PROTOCOL IN A COUNTY HOSPITAL

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Purpose:

The purpose of this project is to evaluate the use of a nurse-driven dosing protocol for argatroban in patients with known or suspected heparin-induced thrombocytopenia (HIT) to determine whether this protocol positively impacts patient care.

Methods:

This is a retrospective observational study comparing data from patients before and after the initiation of an argatroban dosing protocol. The protocol includes two nomograms, standard and hepatic/critically ill. The study will observe patients at Wishard Memorial Hospital, a 350 bed safety-net hospital in Indianapolis, IN. Patients will be included if they are age 18 or older and receive argatroban by protocol for documented or suspected HIT. Data from patients managed on the protocol will be compared to patients who received argatroban between 2003 and 2008. Exclusion criteria include patients with different aPTT goals than specified by the protocol, those who require an argatroban infusion rate <0.02 mcg/kg/min, and prisoners. The primary endpoint will be percentage of patients within therapeutic range at approximately 4, 6, 12, 24, 48, 72, and 96 hours. These results will be compared between patients managed with or without the protocol. Secondary endpoints will include an analysis of additional efficacy and safety events.

Preliminary Results:

Since implementation, 11 patients have been managed with the argatroban protocol. Data has been collected thus far on patients who received argatroban between August and December 2009 (N=7). Five of these patients received hepatic/critically ill dosing, while two patients received standard dosing. The percentage of patients in therapeutic aPTT range is as follows: 57% at 4 hours (n=4/7), 43% at 6 hours (n=3/7), 86% at 12 hours (n=6/7), 67% at 24 hours (n=4/6), 80% at 48 hours (n=4/5), 100% at 72 hours (n=5/5), and 67% at 96 hours (n=2/3). Conclusions to follow upon completion of data collection.

Learning Objectives:

Discuss the criteria for suspicion and diagnosis of heparin-induced thrombocytopenia (HIT)

Identify patients who would likely require dosage adjustment of argatroban when used for known or suspected HIT

Self Assessment Questions:

Heparin-induced thrombocytopenia (HIT) should be suspected in patients who experience a decrease in platelets of at least ___% ?
a.10%
b.25%
c.50%
d.75%

Which of the following patients would NOT likely require reduced dosing of an argatroban infusion?
a. 54 yom, s/p MVC; PMH: HTN, DMII; located on med/surg unit; stable condition; labs wnl
b. 73 yof with CHF exacerbation; PMH: COPD, CHF, OSA; located in MICU; intubated/sedated
c. 43 yof with severe sepsis; PMH: not significant; located in SICU; intubated/sedated; on CVVH
d. 64 yom with CAP; PMH: HTN, cirrhosis, Hep C; located on med/surg unit; stable condition

EVALUATION OF THE FREQUENCY, ACKNOWLEDGEMENT AND APPROPRIATE DOCUMENTATION OF CRITICAL DRUG INTERACTIONS

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Purpose: Computerized physician order entry (CPOE) is an efficient system for decreasing injury from critical drug interactions (CDIs). CPOE can reduce CDIs when clinical decision support features such as drug-drug interaction (DDI) alerts are activated in the system. At the Louis Stokes Cleveland Veterans Affairs Medical Center (LSCVAMC) there are both significant and critical DDI alerts in the CPOE computerized patient record system. Significant drug interactions do not require a provider comment, but CDIs do require both the provider and the pharmacist to place a comment that specifies the action taken. If the provider does not have a satisfactory comment, it is up to the pharmacist to contact the provider to ensure that he/she is aware of the of the interaction and has weighed the risks and benefits of the interacting drug pair for the patient.
In January 2009, the pharmacy staff reviewed CDIs and determined twenty-five CDIs to focus on and added recommendations in the CPOE system. The goal of this additional safety check was to have the provider realize the interaction and adjust the drug choice prior to the order being received in the pharmacy.

Objective: To determine the frequency of, acknowledgement and appropriate documentation of specific critical drug interactions in both the inpatient and outpatient settings at LSCVAMC.

Methodology: Retrospective chart review of patients currently prescribed one of the following critically interacting drug pairs: nitroglycerin/vardenafil, dofetilide/moxifloxacin, methotrexate/ trimethoprim, dofetilide/hydrocholorthiazide, clarithromycin/simvastatin, erythromycin/simvastatin, cyclosporine/simvastatin, hydrochlorothiazide/lithium, allopurinol/mercaptopurine, allopurinol/azathioprine, and amiodarone/digoxin. The comparison will occur before the recommendations were added to the CPOE system (May1st-October 31st, 2008) and after (May1st-October 1st, 2009). The following data will be collected: age, gender, action taken by physician and pharmacist,appropriateness of the action. Chart review data will be analyzed in a Microsoft Excel. This study was approved by the IRB committee.

Results/conclusions: Results pending.

Learning Objectives:

Recognize critical drug interactions.

Identify methods to prevent critical drug interactions.

Self Assessment Questions:

True or False: Critical drug interactions require both the provider and the pharmacist to acknowledge the drug interaction.

Which of the following is NOT a method of preventing critical drug interactions:
a. Use a computerized physician order entry system
b. Prospective surveillance of medication orders by pharmacy
c. Automatic alerts for providers when entering order for interacting drugs
d. Providers and pharmacist should never document they are aware of critical interactions

THE VALUE OF INTRODUCTORY PHARMACY PRACTICE EXPERIENCE STUDENTS MEDICATION RECONCILIATION IN PATIENTS ADMITTED VIA THE EMERGENCY DEPARTMENT

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Background
The highest incidence of medication errors is observed in the emergency department (ED) or during transfer of care. Positive impact of ED pharmacists for medication reconciliation is widely accepted, yet adoption is limited due to pharmacist shortage. In response to the pharmacist shortage, pharmacy schools have not only increased enrollment, but have designed curriculum to provide earlier Intermediate Pharmacy Practice Experiences (IPPE). Previous studies implementing Advance Pharmacy Practice Experience students to assist with medication reconciliation are positive, but data for IPPE students is limited.

Objectives
The first objective is to pilot a medication reconciliation program involving IPPE pharmacy students for veterans admitted to the medical center via the ED. The second objective is to describe differences/value in current medication reconciliation by ED staff/acute care staff versus pharmacy students notes.

Statement of methods
The University of Michigan College of Pharmacy will provide special training for IPPE students as well as a laboratory course where students will present patient cases. Students will receive onsite orientation at the VA and take a pre-/post-experience survey. IPPE students will review two to four patients weekly who present to the ED during September 2009 to April 2010. ED staff and/or acute care staff medication reconciliation notes (current process) will serve as a control. IPPE students will review patient charts, interview patients, and write medication reconciliation notes using Microsoft Word. The value of a students notes will be compared to notes by the acute care staff and/or ED staff using predetermined criteria (medication histories, drug problems, patient compliance, medication suggestions).

Results/Conclusions
Data collection and analysis are currently ongoing. Data collected will assist in improving future IPPE clinical experience and optimizing the IPPE medication reconciliation process. If IPPE students notes consistently improve patient care, implementation into EMR can be considered.

Learning Objectives:

Describe the current state of medication reconciliation at the VAAAHS and identify opportunities for improvement.

Describe the need for experiential learning and the opportunity for IPPE students to provide medication reconciliation services

Self Assessment Questions:

T/F IPPE pharmacy students cannot be exposed to direct patient care activities because they are not licensed healthcare professionals and have not completed their pharmacy training

T/F Medication reconciliation is only required on patients with 15 or more medications at the transfer of care.

ELECTRONIC MESSAGING WITHIN E-PRESCRIBINGS AFFECT ON PRIOR AUTHORIZATION

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Background:
Prior authorization (PA) programs have become standard cost-saving strategies frequently used by managed care organizations to encourage appropriate use of medications. The PA workflow can be time-consuming and can cause delays in the medication use process. Physicians are increasingly relied upon to both initiate the prior authorization on behalf of their patients and provide the information needed for the managed care organization to make rational coverage determination decisions. The current PA process is primarily fax-based and is often not transparent to physicians. PA messaging through prescribing features of physician electronic health record software (e-prescribing) may allow prescribers to have up-to-date PA contact information before a prescription is presented at a pharmacy. This may decrease the time to obtain coverage determinations and lead to a more efficient system where patients can obtain their medications without delays at the point-of-service.

Objective: To determine how electronic PA messaging within e-prescribing affects efficiency of the PA process.

Methods: We will perform a controlled prospective investigation of how the delivery of prior authorization contact information via e-prescribing compares to the current fax-based process commonly used by managed care organizations. E-prescribing, coverage determination and claims data from a large PBM will be collected between November 2009 and March 2010. A control group of physicians who do not utilize e-prescribing will be selected and compared to a group of e-prescribing physicians and prescribing activities related to medications included in the PBMs prior authorization programs will be assessed. The primary outcome will be the difference in time to coverage determination between the two groups. The secondary outcome will be the difference in frequency of prior authorization decisions delayed due to physician non-response in each comparator group measured as a percentage of overall total decisions.

Results/Conclusion: Pending completion of data collection and analysis.

Learning Objectives:

Describe features offered within electronic health record software

Describe the impact prior authorization has on the workflow of a retail pharmacy

Self Assessment Questions:

How can e-prescribing messaging avoid delays for the patient at the point of service?

What is the purpose of prior authorization?

IMPLEMENTATION AND EVALUATION OF EXTENDED INFUSION PIPERACILLIN-TAZOBACTAM IN A COMMUNITY HOSPITAL

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Background: Pharmacokinetic studies and published data suggest the use of extended infusion piperacillin-tazobactam (EIPT) may result in better patient outcomes compared to intermittent thirty-minute infusions. Specifically, Lodise and colleagues observed clinical improvements in critically ill patients with Pseudomonas infections. Although some teaching institutions have implemented EIPT, the plausibility of EIPT was yet to be implemented and evaluated at our institution.

Purpose: The aim of the residency project was to implement an EIPT pilot program at the community hospital level with a focus on pneumonia patients in the Intensive Care Unit (ICU).

Methods: A six-month retrospective chart review (May-October 2009) of pneumonia patients in the ICU was conducted. Inclusion criteria consisted of patients with: creatinine clearance ≥ 40 milliliters/minute, age ≥ 18 years old, patients placed on P-T within the first 48 hours of admission, patients administered P-T for ≥ 2 days, and pneumonia diagnosis. Exclusion criteria consisted of patients with: congenital respiratory disorders, neutropenia, prior beta-lactam antibiotic administration during current visit, hemodialysis or transplant patients, or patients with a beta-lactam allergy. Data collected included: age, gender, APACHE-II scores, Pneumonia Severity Score (PSI), white blood cell count, body temperature (oral), ICU length of stay, overall hospital length of stay, duration of P-T therapy, and microbiological data. The chart review indicated a potential benefit for our patients since 34.8% received doses of P-T at total daily doses greater than the "3.375 grams IV Q8 hours" regimen. The project proposal was presented and approved by the Institutional Review Board as well as hospital committees. Prior to implementation, time was dedicated to train and inform pharmacy and nursing staff of the program. Implementation of EIPT began January 4, 2010 in which qualified patients were converted to 3.375 grams IV Q8 hours (each dose infused over 4 hours) pending physician approval.

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

Learning Objectives:

Explain the rationale behind the use of extended infusion of intravenous beta-lactam or cephalosporin antibiotics.

Recognize factors that may contribute to both opportunities and barriers of EIPT implementation at an institution.

Self Assessment Questions:

Piperacillin-tazobactam (P-T) exhibits _____ pharmacokinetics.
a.Time-dependent
b.Concentration-dependent
c.Both time- and concentration- dependent
d.Time-independent

What is the purpose of utilizing extended infusion piperacillin-tazobactam (EIPT)?
a.To reduce the total amount of P-T administered in order to potentially improve patient outcomes
b.To preserve the utility of the antibiotic given increased resistance.
c.To potentially reduce the incidence of antibiotic-related adverse events (ex. Clostridium difficile associated diarrhea).
d.All of the above.

DEVELOPMENT, IMPLEMENTATION, AND ASSESSMENT OF A SEDATION AND AGITATION GUIDELINE FOR THE PEDIATRIC INTENSIVE CARE UNIT

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Background: Sedation must be managed properly to provide comfort, with standard agents including fentanyl, morphine, and midazolam. The emergence of dexmedetomidine has led many physicians to alter their prescribing habits and increasingly order it due to possible beneficial effects for intubated patients. Due to the high cost, however, inappropriate use causes a direct effect on the drug budget.

Purpose/objective: The purpose of the project is to maximize the safe, effective, efficient, and cost-effective use of pediatric sedation and agitation medications in the pediatric intensive care unit (PICU). The objective is to create and implement an evidence/consensus based guideline and assess compliance.

Methods: Complete review of the current literature and discussion with pediatric ICU physicians and pharmacists to obtain a consensus on the guideline. The project has been IRB approved and will be submitted to the Pharmacy and Therapeutics Committee for approval. Full implementation will be achieved by posting the guideline on the hospital intranet, speaking with ICU physicians, and placing the guide in the ICU resident handbook. Compliance with the dexmedetomidine component of the guideline will be assessed for the first 30 patients, 1 day to 18 years of age, who are intubated and sedated for at least 1 day, and subsequently placed on dexmedetomidine. Baseline characteristics will include age, past medical history, prior to admission medications, and current sedation and agitation medications. Patient records will be assessed for reduction in concurrent sedative agents after start of dexmedetomidine, length of use of dexmedetomidine, and dexmedetomidine initiation based on criteria: hypersensitivity to midazolam, no known hypersensitivity to dexmedetomidine, sole agent for neurosurgery patients requiring frequent neurologic assessments, and elective extubation planned within 1 day. Compliance evaluation will be completed by myself, based on the stated criteria, and the results will be presented using descriptive statistics.

Learning Objectives:

Identify possible barriers to creating a guideline based on consensus and evidence-based medicine.

Explain the criteria, based on consensus and recommendations, for use of dexmedetomidine and how it is dosed in the PICU

Self Assessment Questions:

True or False: Coordination and input from several expert groups must be obtained to successfully create an evidence/consensus based guideline.

Which one of the following is not an appropriate criterion for using dexmedetomidine?
a. Agent for neurosurgery patients requiring frequent neurologic assessments
b. Hypersensitivity, severe reaction, or contraindication to midazolam
c. Weaning from ventilation and preparation for extubation within one day
d. For use one week before extubation and in weaning ventilation

CHARACTERIZATION OF POINT-OF-DISPENSING PLANS FOR MASS PROPHYLAXIS OF HOSPITAL EMPLOYEES DURING BIOLOGICAL PUBLIC HEALTH EMERGENCIES

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PURPOSE: The terrorist attacks on the World Trade Center in 2001, the subsequent anthrax mailings, and, recently, exposures to H1N1 influenza have demonstrated the importance of timely and efficient emergency response during biological events. To prepare for biological events that require coordinated mass-dispensing of antibiotics, the Centers for Disease Control (CDC) and the Agency for Healthcare Research and Quality (AHRQ) have developed guidelines for community-based point-of-dispensing (POD) units. These plans do not provide guidance for planning mass prophylaxis within hospitals. Yet, in the event of a bioterrorist attack or pandemic, providing mass antibiotic prophylaxis to hospital workers and their families may be required to ensure continued hospital operation.

The purpose of this survey research is to characterize the current state of hospital POD plans among hospitals nationwide and to determine the extent to which existing hospital POD plans adhere to published guidelines. The results of this study should characterize POD plans for mass prophylaxis of hospital employees during biological public health emergencies and may help determine what areas of POD plan development lack needed pharmacy support. Results of the study may be helpful in elucidating optimal deployment of pharmacy resources in emergency preparedness.

METHODS: The survey will be developed using a web-based survey tool (Qualtrics). Survey items will be reviewed by a committee and then piloted before email distribution. The survey will be administered via an emailed link through the ASHP list serve for the Section of Pharmacy Practice Managers.

The targeted survey population will be all pharmacists subscribing to the ASHP list serve for the Section of Pharmacy Practice Managers. As of 12/2009 this list serve had 2146 subscribers. Data will be collected and analyzed to establish trends and associations. Respondent data is collected, pooled, and tabulated using the Qualtrics survey design software.

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

Learning Objectives:

Define, describe, and discuss point-of-dispensing plans for mass prophylaxis of hospital employees during biological public health emergencies

Identify pharmacys involvement in the development of hospital-based POD plans and pharmacys role in the execution of hospital-based POD plans

Self Assessment Questions:

What is a hospital-based point-of-dispensing plan?

What is the extent of pharmacy involvement in the development and execution of hospital-based point-of-dispensing plans?

EVALUATING THE ROLE OF MOBILE PHONE AND INTERNET TECHNOLOGIES IN THE USE OF PERSONAL HEALTH AND MEDICATION INFORMATION FOR ADULT PATIENTS IN A FEDERALLY QUALIFIED HEALTH CENTER (FQHC).

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Purpose: The use of mobile phone and internet technologies for personal health and medication information has grown with the increase in access to these technologies; however, there is a lack of published
data looking specifically at the use of these technologies by patients of FQHCs. The primary objectives is: To evaluate the role of mobile phone and internet technologies as related
to the use of personal health and medication information by examining the current access, interests, and attitudes of adult patients in FQHCs. The secondary objective is: To explore potential relationships between medication adherence and the access, interests, and attitudes of adult patients in FQHCs related to these technologies.

Methods: The study will be conducted at three FQHCs. Patients 18 years of age and older, sense of hearing intact and scheduled for an appointment with an adult medicine provider, will be asked to participate in a survey administered either before or after their appointment. They will be invited to enroll in the study and participate in an online questionnaire that will be administered by a pharmacist. The questionnaire will be accessed online by the survey administrator and given verbally to the patient. The survey will consist of questions designed to assess the current access, interests, and attitudes related to mobile phone and internet technologies in the use of personal health and medication information. Additional questions will be administered to measure medication adherence as well as demographic information.

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

Learning Objectives:

Describe the relationship between medication adherence and the use of mobile phone and internet technologies

Identify the differences in the use of technologies for personal health and medication information in elderly and minority populations

Self Assessment Questions:

True/False: Evidence suggests that Hispanic and black populations use both mobile phone and internet technologies less than the white population

True/False: Medication adherence rates are significantly higher statistically in populations that use more technologies for personal health and medication information.

OUTCOMES IN BURN PATIENTS WITH CIRRHOSIS

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Background: According to the United States National Vital Statistics Report chronic liver failure and cirrhosis are the ninth leading cause of death. Altered glucose homeostasis, clotting factor and protein synthesis may contribute to worse outcomes in burn patients with preexisting cirrhosis. A previous study investigating liver disease in burn injuries suggests that liver impairment worsens outcomes.

Purpose: To evaluate outcomes in cirrhotic patients with burn injuries admitted to Detroit Receiving Hospital.

Methods: This study is an IRB approved retrospective review of cirrhotic patients with burn injuries. Patients were included if they had a history of liver dysfunction and burn injuries requiring admission to the burn surgery service from January 1, 2000 through June 30, 2009. Exclusion criteria are patients < 18 years of age or those with do-not-resuscitate status. A list of all burn patients with ICD-9 codes for liver dysfunction (70.0 - 70.9 and 570.0 - 573) was obtained from the hospital trauma registry. Study patients were matched in a 3:1 fashion based on severity of burn injury and the presence or absence of inhalation injury. Baseline demographics (age, gender, race, admitting diagnosis), pertinent laboratory findings (ALT, AST, total bilirubin, albumin, platelets, prothrombin time and international normalized ratio), Child-Pugh score, APACHE II, SOFA and OSF scores were recorded for analysis. Outcomes such as hospital and ICU length of stay, duration of mechanical ventilation, use of blood products, number and interval of surgeries, and hospital mortality were evaluated. All data will be analyzed with SPSS version 17.0 and p values ≤ 0.05 will be considered statistically significant.

Results: The results and conclusions will be presented at the conference.

Learning Objectives:

Discuss the pathophysiology of cirrhosis and burn injuries.

Examine the impact preexisting cirrhosis has on outcomes in burn patients.

Self Assessment Questions:

Which scale is used to classify liver dysfunction?

A. APACHE II
B. Child-Pugh
C. MEND
D. OSF

Patients with a combination of cirrhosis and burn injury have increased rates of mortality? True or False

DEVELOPMENT OF AN INTERDISCIPLINARY INTRAVENOUS TO ORAL MEDICATION CONVERSION PROCESS

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Purpose:

At The Ohio State University Medical Center, a recently revised Pharmacy & Therapeutics Committee Medication Use Policy outlines new procedures for making IV to PO conversions. Patients who are eating solid foods or receiving their nutrition through tube feeds are eligible for IV to PO medication conversion for specifically approved medications. The purpose of this study is to assess compliance with the policy and determine the financial impact of an interdisciplinary IV to PO medication conversion process.

Methods:

This study is composed of an evaluation period and a retrospective data collection period. During the evaluation period, daily reports of patients receiving IV linezolid, fluconazole, moxifloxacin, and voriconazole will be automatically generated and printed in the Department of Pharmacy. Pharmacists will review each patients active dietary orders in the electronic medical record. If patients are receiving their diet orally or by tube feed, the pharmacist will contact the physician to alert him/her of patient eligibility for conversion. Once the physician has approved the conversion, the pharmacist will discontinue the IV medication order and enter the order for the PO equivalent into the computerized order entry system through a "protocol" ordering pathway. Data collected include: medication; time taken for conversion attempts; number of people contacted; number of conversion attempts made; and the reason(s) for unsuccessful conversion.

Additionally, data will be collected retrospectively from July 1, 2008 through June 30, 2009 to serve as a historical control. Retrospective data will be used to determine the average length of IV, PO, and total therapy of the targeted medications. The IV to PO ratio will be calculated for all medications and compared in both parts of the study to determine average annualized cost-savings per medication.

Results/conclusions:

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

Learning Objectives:

List the 3 primary reasons for converting patients from IV to PO when medically appropriate.

Discuss how much prescription drug costs contribute to a hospitals overall cost of goods and services.

Self Assessment Questions:

1. Which of the following are reasons to switch patients from IV to PO when medically appropriate?
a. In most cases, PO medications are cheaper than their IV counterparts
b. PO medication use decreases the need for a line, which decreases the risk of infection
c. PO medications decrease the amount of time required by nurses for administration
d. All of the above

2. Aside from wages and salaries, which of the following contributes the most to a hospitals overall cost of goods and services?
a. Liability insurance
b. Professional fees
c. Prescription drugs
d. Food

UTILITY OF IMPLEMENTING A ROBOTIC SYSTEM FOR PREPARATION OF INTRAVENOUS STERILE PRODUCTS IN AN ACADEMIC MEDICAL CENTER

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PURPOSE: The pharmacy sterile products area at the University of Wisconsin Hospital and Clinics (UWHC) dispenses over 670,000 doses of medication annually. Automation and robotic technology has little impact on the preparation of IV sterile products at UWHC, as greater than 90% of all prepared doses are produced manually. Intravenous sterile product robotic technology offers the potential of increasing the safety and accuracy of IV sterile product preparation. The intent of this project is to assess the utility of implementing automation and technology into the IV sterile product workflow at UWHC.

METHODS: An analysis of the current practice of IV sterile product preparation at UWHC was performed, including an assessment of workload volumes, supply costs and time studies. A gap analysis of current practice compared to recommendations outlined in USP <797> and ASHP Policy and Position Guidelines was performed. Following completion of the gap analysis, a steering committee assisted in creating a directed request for proposal (RFP) sent to vendors. An evaluation tool was developed to compare and rank each piece of technology on required operational and safety features identified by the steering committee. A return on investment (ROI) template was created to determine the financial feasibility of each piece of technology.

RESULTS: Results of the evaluation are forthcoming. Upon completion of the evaluation and ROI analysis, a business plan will be created outlining the most appropriate action for UWHC to pursue in incorporating and implementing robotic technology into its sterile products workflow.

CONCLUSION: Intravenous automation is promising, yet still developing technology. When optimized, it has the potential to provide opportunities to decrease errors and improve the safety, accuracy and efficiency of the IV compounding process.

Learning Objectives:

Identify potential benefits of automating the process of IV sterile product compounding.

Recognize the challenges associated with the identifying the appropriateness of investing in and implementing robotic technology within an institutional pharmacy setting.

Self Assessment Questions:

List two areas of cost avoidance that may be achieved by implementing an IV robot that are difficult to quantify.

(True/False) IV robotics is cutting-edge technology that may benefit the pharmacy by improving the accuracy of the IV production process, decreasing errors in the compounding process, and decreasing exposure of employees to hazardous medications.

MOVING TOWARD PALLIATIVE SEDATION GUIDELINES: A SURVEY OF HOSPICE PHYSICIANS

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Purpose:
Terminally ill patients may experience symptoms such as intractable pain, agitation or delirium that are refractory to standard treatment options. In instances where these symptoms can not be controlled despite exhausting standard therapeutic options, many health care providers implement palliative sedation. De Graeff et. al. define palliative sedation as the use of specific sedative medications to relieve intolerable suffering from refractory symptoms by a reduction in patient consciousness, using appropriate medications carefully titrated to the cessation of symptoms.

Currently, there is very little clinical data regarding the most effective medications used in palliative sedation. Clinicians in The Netherlands and Japan have developed practice guidelines for palliative sedation. The applicability of these guidelines is limited in the United States. Firstly, the guidelines call for the use of medications that are not available in the United States. Additionally, several of these guidelines fall short of recommending specific agents for use as 1st, 2nd, and 3rd line. The objective of the study is to determine which medications are currently being utilized for palliative sedation in the United States. The results will be used to begin development of a palliative sedation protocol.

Methods:
Prior to initiation of this research project, the study will be submitted to the Ohio State University Institutional Review Board for approval. A non-randomized, cross-sectional online survey will be sent to physicians that specialize in hospice and palliative care. Questions include hospice demographics, physician demographics, experience with palliative sedation and comfort with drug selection when implementing palliative sedation. Additional questions will address 1st, 2nd and 3rd line medications used; route of administration; starting dose, maximum dose and frequency of administration. De-identified data will be provided to The Ohio State University Center of Biostatistics to conduct the statistical analysis.

Results/Conclusions:
Preliminary results to be presented at Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Define the role of palliative sedation in the treatment of terminally-ill patients experiencing refractory symptoms.

Outline the different medications currently being used for palliative sedation by physicians in the United States.

Self Assessment Questions:

True/False: Opioids are generally considered to be the drugs of choice when implementing palliative sedation.

True/False: Palliative sedation should be used routinely for the management of symptoms at end-of-life.

IMPLEMENTATION OF AN ANTIMICROBIAL STEWARDSHIP PROGRAM IN A COMMUNITY HOSPITAL

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Statement of Purpose:
Many institutions are implementing antimicrobial stewardship programs (ASP) as a means to promote the appropriate use of antimicrobials due to the increasing development of resistance, concern of hospital-acquired infections, and financial impact of antimicrobial therapy. The objective of this project is to initiate an antimicrobial stewardship program to promote the appropriate use of antimicrobials.

Methods:
Protocols and policies were implemented as a means of promoting appropriate antimicrobial use. Areas of focus include dose optimization, scheduled antimicrobial discontinuation, cost containment, and appropriate selection of antibiotics. Dose optimization involves the implementation of a 4-hour extended-infusion for piperacillin-tazobactam. The extended-infusion allows the pharmacodynamics of the medication to be maximized while administering a lower daily dose. An additional component of this project is expansion of antimicrobial discontinuation. A seven-day autostop is applied to azithromycin, cefazolin, daptomycin, and tigecycline. Cost containment strategies include IV to PO policy updates, education for the implementation of a protocol for vancomycin use in hemodialysis patients, and dose rounding of daptomycin. The inclusion and exclusion criteria are revised for the IV to PO policy to allow more patients to qualify for conversion. A protocol for vancomycin treatment in hemodialysis patients is designed to standardize monitoring among clinicians. Dose rounding and standard administration times is initiated for daptomycin therapy to maximize recycling of doses that are compounded and prevent unnecessary waste. Additional ongoing aspects of the project include antibiotic de-escalization, medication use evaluations, and development of order sets. Antibiotic de-escalization is a proactive recommendation for simplified therapy based upon positive culture results. A combination of national guidelines and local antibiogram data is used to develop order sets to guide prescribers to the appropriate selection of antimicrobials.

Conclusions:
Antimicrobial stewardship programs provide the hospital the opportunity to provide cost containment strategies and guide clinicians to more appropriate antimicrobial use.

Learning Objectives:

Describe strategies to implement an antimicrobial stewardship program.

Describe reasons why antimicrobial stewardship programs are advantageous.

Self Assessment Questions:

IV to PO pharmacist-driven policies are a means of cost containment within an antimicrobial stewardship program.

The development of resistance to antimicrobial agents is a reason why antimicrobial stewardship programs are of growing importance.

IMPLEMENTATION AND EVALUATION OF A PILOT PHARMACIST-CONDUCTED MEDICATION THERAPY MANAGEMENT (MTM) SERVICE FOR POLYPHARMACY PATIENTS IN A MANAGED CARE SETTING

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Objectives:
To assess the feasibility of a pilot pharmacist-conducted medication therapy management (MTM) service for high-risk polypharmacy patients in a managed care setting.
Methods:
This observational study takes place in the outpatient pharmacies within four ambulatory clinics under a non-profit managed care organization in Wisconsin. Patients with the highest number of prescription usage 3 months prior to the screening are identified from the claims database. Primary care providers (PCPs) are then notified and requested for making patient referrals to pharmacist for the face-to-face MTM consultations. Referred patients are invited through letters and phone calls to voluntarily participate in the study. A comprehensive medication review (CMR) is first performed by pharmacist prior to the MTM to identify any drug-related problems (DRPs) based on patients electronic medical records. During MTM sessions, pharmacist interview patients to address additional DRPs; discuss possible therapeutic interventions; provide patient education and adherence counseling. Patient satisfaction surveys are provided at the end of MTM. A final pharmaceutical care plan with drug therapy recommendations is generated for each patient and sent to PCPs. Any agreed medication changes by PCP are communicated to each patient. Three months after the date of inclusion, medications of each patient are again screened for DRPs. Patients who completed initial MTM are followed-up at the same time through telephone to evaluate resolution of their DRPs. Collected data include process measures (type and number of DRPs identified, pharmacist recommendations and physician acceptance of recommendations), economic measures (number and cost of medications used), and humanistic measures (patient satisfactions with service). Descriptive data will be presented and a longitudinal analysis will be performed to compare the outcome measurements before and after the implementation of pharmacist-conducted MTM services.
Results/Conclusions:
Results and conclusions will be presented at the Great Lake Conference.

Learning Objectives:

Describe the processes involved in a pharmacist-conducted medication therapy management (MTM) program within a managed care setting (e.g. implementation barriers, operational workflow, provider collaboration and communication, service evaluation, pharmacy reimbursement, etc.).

Describe the prescribing quality in a managed care organization and outline strategies to identify and mitigate polypharmacy by pharmacists through MTM interventions.

Self Assessment Questions:

What are the potential causes and risk factors for polypharmacy?

List some advantages provided by a managed-care environment for the success of a pharmacist-conducted MTM program in combating polypharmacy.

IMPLEMENTATION OF A WARFARIN SAFETY INITIATIVE IN A COMMUNITY HOSPITAL SETTING

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Purpose: The National Patient Safety Goal (NPSG) 03.05.01 states "Reduce the likelihood of patient harm associated with the use of anticoagulation therapy." The Joint Commission (TJC) recognizes anticoagulation as a high risk therapy, secondary to adverse drug events impacting morbidity and mortality. As a result, TJC promotes standardizing anticoagulation practices to reduce the number of adverse events associated with anticoagulation. A multi-center retrospective review will be conducted to determine the impact of an educational plan regarding the NPSG 03.05.01 on the use of a standardized warfarin order set in attempts to meet the standards set forth by TJC.

Methods: Inpatients at St. Elizabeth Healthcare receiving warfarin therapy during July 1-7, 2009, November 1-7, 2009, and February 1-7, 2010 and greater than the age of 18 are eligible for inclusion, and patients who are pregnant are excluded. A preprinted warfarin order set was approved by all appropriate patient care committees and implemented in August 2009. Healthcare providers were provided NPSG 03.05.01 and order set education by means of emails, face-to-face encounters, Medication Management Committee meetings, flyers, posters, and staff newsletters. Inpatients administered warfarin during July, prior to order set implementation, will be used as a baseline comparator. The primary outcome will be compliance with use of the warfarin order set. The secondary outcomes include the percent of initial warfarin doses given with baseline INRs, percent of subsequent doses given with current INRs, percent of patients with discharge counseling documentation, and percent of patients with appropriate anticoagulation management follow-up documentation.

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

Learning Objectives:

Describe the warfarin-specific components of NPSG 03.05.01.

Discuss the risks of anticoagulation therapy and rationale behind NPSG 03.05.01.

Self Assessment Questions:

T/F: Studies have shown the benefits of standardized anticoagulation practices with pharmacist involvement in reducing the number of adverse events associated with anticoagulation.

Warfarin therapy is a high risk treatment for the following reason(s):
a.It has a narrow therapeutic window
b.There is wide inter-patient dosing variability
c.It is subject to interactions with diet and medications
d.There is difficulty in ensuring patient compliance with outpatient therapy
e.All of the above

EVALUATION OF ANTIRETROVIRAL PRESCRIBING ERRORS IN HOSPITALIZED PATIENTS

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Purpose: Patients with human immunodeficiency virus (HIV) admitted to the hospital often receive inadequate antiretroviral (ARV) therapy. The primary objective of this study is to compare the prevalence of ARV prescribing errors during inpatient hospitalization and upon discharge before and after the initiation of pharmacist obtained medication histories and Infectious Disease (ID) pharmacist interventions. Identification of specific processes will be developed to further decrease medication errors and increase patient safety.

Methods: This is a retrospective, single-center, non-randomized, cohort study of patients admitted to Froedtert Hospital (FH) from January 2008 to February 2009 who received ARVs.

Inpatient medication history notes obtained by pharmacy were reviewed, and names of ARVs and other concurrent medications were collected. Dosages and frequencies of dispensed ARVs, patient age, sex, race, admitting diagnosis, admitting service, serum creatinine/creatinine clearance, height/weight, ID consult recommendations, and length of stay were collected from patient medical records. Patients included in the study were HIV-infected patients prescribed ARVs while hospitalized and patients intending to continue ARVs once discharged. Patients excluded were those who received ARVs for post-exposure prophylaxis, patients who left against medical advice, patients with discontinued ARV therapy during hospitalization or on discharge, patients not receiving ARVs prior to or throughout hospital admission, and patients who were admitted to a unit where medications histories were not performed by a pharmacist. Primary outcomes include rate and type of prescribing errors during hospitalization and upon discharge. Secondary outcomes include the number of pharmacy interventions and assessing the need for pharmacy education with a focus on HIV prescribing patterns.

Results: Data collection is ongoing. Final results will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Identify common prescribing errors that occur with antiretrovirals.

Discuss the impact a pharmacist can make on minimizing antiretroviral medication errors.

Self Assessment Questions:

What are the most common errors that occur with antiretrovirals when a patient is admitted to the hospital?
A. Drug Interactions
B. Omission of an antiretroviral
C. Drug Disease Interactions
D. All of the above

T/F Pharmacists can decrease prescribing errors by obtaining accurate medication histories from patients on antiretrovirals.

A PILOT STUDY TO EVALUATE A TELEPHARMACY INTERVENTION TO IMPROVE INHALER ADHERENCE IN VETERANS WITH COPD

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Purpose: Within the Veterans Heath Association (VHA), chronic obstructive pulmonary disease (COPD) presents significant morbidity and mortality. Approximately 19% of men and 17% of women have been diagnosed with COPD within the veteran population. Adherence to inhaler medications may impact morbidity and mortality. However, many patients have poor adherence; especially those prescribed multiple inhaled medications. The purpose of this study is to conduct a pilot test of a telephone counseling intervention to improve COPD patients inhaled medication use.

Methods: Patients with COPD will be prescreened for poor adherence from pharmacy records. Patients with a medication possession ratio of less than 80% or over 120% will be invited to participate in the study. One hundred patients will be randomized to an intervention or control group. The intervention consists of telephone counseling to assess patients adherence issues and to develop strategies to improve medication use. Potential strategies to improve medication use include motivational interviewing, education about COPD, and reminder aids. The control group will receive usual care of printed material with mailed prescriptions. Pre- and post-intervention surveys will be conducted to assess COPD severity and self-reported adherence. Medical chart and pharmacy records will be reviewed to evaluate exacerbations, hospitalizations, and medication possession. Bivariate and multivariate analyses will be conducted to examine the differences between the intervention and control groups. In addition, a small subset of patients will be interviewed to assess their attitudes and opinions regarding the intervention.

Results/Conclusions: Pending.

Learning Objectives:

List possible barriers to medication adherence.

Recognize counseling methods to identify and resolve adherence issues.

Self Assessment Questions:

What is the most common barrier to medication adherence?
A. Patient beliefs
B. Forgetfulness
C. Technique

T/F: The three prime questions were developed by the veterans health association to recognize non-adherence in the veteran population?

OUTCOMES OF AMPC PRODUCING ENTEROBACTERIACEAE WITH A FALSE POSITIVE MODIFIED HODGE TEST

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PURPOSE: Organisms in the Enterobacteriaceae group of Gram-negative bacteria have the potential to produce a variety of different beta-lactamases, resulting in hydrolysis of different beta-lactam antibiotics. When these organisms produce carbapenemases, treatment options are limited. Recent reports have suggested that bacteria that produce AmpC or extended spectrum beta-lactamases, in combination with porin deletion, may lead to false positives on tests used for carbapenemase detection. At Henry Ford Hospital, a group of isolates that produce AmpC beta-lactamases have been isolated and tested positive for carbapenemase production. This primary objective of this study was to describe clinical outcomes of patients infected with AmpC producing Enterobacteriaceae with a false-positive modified Hodge test. Secondary objectives included identification of patients with false-positive modified Hodge tests by use of real time polymerase chain reaction (PCR) for blaKPC and description of microbiologic characteristics.

METHODS: This study is divided into two parts, the microbiologic identification of the resistance mechanisms produced by these bacteria, and a retrospective analysis of patient risk factors, treatment characteristics, and outcomes. Thirty-eight Enterobacteriaceae isolates were tested for AmpC production with an AmpC disk test (using a cefoxitin disk) and carbapenemase production using a modified Hodge test. Carbapenemase production was then confirmed by real time PCR to detect blaKPC. Microbiologic susceptibilities were performed by Epsilometer testing and Vitek 2 according to Clinical Laboratory Standards Institute methodology. The clinical data collection was done through a retrospective chart review. Data on risk factors for beta-lactamase acquisition, previously reported microbiologic data, antibiotic treatment, and clinical and microbiologic treatment outcomes were gathered and assessed. Clinical and microbiologic outcomes were then adjudicated by two reviewers blinded to molecular and treatment characteristics. Descriptive statistics will be used to analyze the data.

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

Learning Objectives:

Identify potential treatment options for infections caused by carbapenemase-producing microorganisms.

Describe the methods used for detecting the presence of different beta-lactamases in Enterobacteriaceae.

Self Assessment Questions:

Which of the following antibiotics can be used to treat a Klebsiella pneumoniae carbapenemase producing organism (depending on site of infection)?
a.Cefepime
b.Imipenem
c.Aztreonam
d.Tigecycline

Which of the following testing methods is used to detect the presence of a gene encoding for Klebsiella pneumoniae carbapenemase production?
a.Modified Hodge test
b.Polymerase chain reaction
c.E-test
d.Disk diffusion test

IMPROVEMENT OF ERYTHROPOIESIS STIMULATING AGENT MANAGEMENT THROUGH PHARMACY INVOLVEMENT IN A COMMUNITY HOSPITAL

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Purpose
Erythropoietin stimulating agents (ESAs) are effective in achieving and maintaining target hemoglobin (Hgb) levels in patients experiencing anemia due to chronic kidney disease (CKD) or chemotherapy. The FDA recently issued a black box warning stating an increase in mortality, serious cardiovascular and thromboembolic events when Hgb levels are targeted at higher levels. Saint Margaret Mercy (SMM) is a 2 campus 800+ bed hospital located in northwest Indiana. The formulary ESA is darbepoetin. The purpose of this study was to improve ESA management at SMM.

Methods
A baseline medication use evaluation (MUE) was performed on fifty randomly selected patients that received at least one dose of darbepoetin between July 2008 and June 2009 while admitted to SMM. The MUE form included data on demographics, dose of ESA, indication, adjustment of dosing based on response, and prescriber. If a physician requested to have pharmacy manage the ESA, weekly darbepoetin doses were prescribed based on Hgb levels for ESA nave patients or the regimen prior to admission was continued.

Results
A total of 50 patients were evaluated with 94 doses of darbepoetin administered. Physicians were managing 86% of the total study population with only 35% of doses prescribed following the dosing algorithm in the hospital protocol. Out of the 14% of patients managed by pharmacy, 71% were managed following the protocol. The protocol was recently updated basing dosing for ESA nave patients on weight. Pharmacy has been approved to manage all ESA usage.

Conclusion
Results show there is a need for improved management of ESAs at SMM. Education has and will be continually conducted for pharmacy staff to better ensure the monitoring of ESA use. Monitoring forms will be utilized to ensure standard of care. Physicians will receive feedback on current ESA usage and will be updated on recent ESA issues.

Learning Objectives:

Identify appropriate usage and goals for ESA therapy.

Discuss the importance of pharmacy involvement in ESA management

Self Assessment Questions:

1)Which of the following is NOT a complication of ESA therapy?
a)Risk of tumor progression
b)Cardiovascular events
c)Thromboembolic events
d)Pulmonary edema

True/False
Increased adverse events occur when Hgb is targeted at lower levels.

EVALUATION OF CENTRAL PHARMACY OPERATIONS AND DEVELOPMENT OF IDEALIZED FACILITY DESIGN AT AN ACADEMIC MEDICAL CENTER

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Purpose: Human factors engineering is the study of human capabilities and limitations and of the application of that knowledge to the design of systems. The application of human factors techniques to improve the medication use system has been recognized as an appropriate and successful method for improvement. However, there is relatively little literature on how to utilize facility design for improving medication preparation and dispensing in the hospital setting.

Central pharmacy operations at UWHC has a dynamic history of change with implementation of various patient safety and operational efficiency improvement initiatives including robotic dispensing, carousels, unit-dose barcode repackaging, and computerized prescriber order entry. These changes reflect a time span of more than 10 years of significant operational changes where workload has increased significantly and available space has been maximized without formal human factors evaluations. This study aims to identify human factors and work design constraints affecting operational performance within the central pharmacy at UWHC.

Methods: Issues will be identified that affect efficiency, safety, accuracy, and/or overall service performance. The work areas of focus include triage, packaging, repackaging, delivery, and daily pharmacy automation technical support. Primary objectives include 1) characterization of the physical work environment according to basic ergonomic principles, 2) characterization of physical movement patterns, 3) identification of reasons for discrepancies between actual and expected staff performance, and 4) development of potential solutions for performance discrepancies. The use of direct observation, activity sampling, staff interviews and questionnaires, link diagrams, and a functional needs assessment will be used for data collection and evaluation. The primary outcome for this study is a physical layout map, designed with Microsoft Visio, incorporating facility design recommendations as a means for improving operations.

Results: Data collection and evaluation are being conducted. A description and assessment of interim results will be presented.

Conclusion: To Be Determined.

Learning Objectives:

Describe some of the symptoms often found in central pharmacy operations that indicate the need for Human Factors Engineering.

Explain common sources of performance discrepancies as it pertains to expected and actual or observed performance.

Self Assessment Questions:

Which of the following indicate a potential need for a Human Factors Engineering intervention?
A)Look-Alike-Sound-Alike characteristics
B)Tedious, repetitious tasks
C)Frequent work-arounds
D)All of the Above

True or False: Environmental factors such as illumination, noise, and climate do not affect human performance.

ASSESSMENT OF EPTIFIBATIDE DOSING IN RENAL IMPAIRMENT PRE AND POST IMPLEMENTATION OF STANDING ORDERS

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Purpose:
Eptifibatide is a glycoprotein IIb/IIIa (GP IIB/IIIA) inhibitor that works by reversibly blocking platelet aggregation to prevent thrombosis. It is FDA approved for use in the treatment of patients with acute coronary syndrome (ACS) and in the treatment of patients undergoing percutaneous coronary intervention (PCI). Total drug clearance is decreased by approximately 50% in patients with moderate to severe renal insufficiency (CrCl < 50 ml/min) increasing the risk of bleeding or other adverse effects. The objective of this study is to assess the appropriateness of eptifibatide dosing before and after implementation of an ACS dosing protocol. In addition this study will determine the impact on bleeding and other adverse effects associated with eptifibatide.

Methods:
This is a retrospective evaluation of eptifibatide infusions in patients with ACS and in patients undergoing a PCI at Advocate Christ Medical Center (ACMC) between September 2007 and September 2009. A list of patients who received an eptifibatide bolus or infusion at any dose will be generated using data from the computerized order entry system. This data will be compared with the data evaluated after the implementation of the eptifibatide ACS dosing protocol starting October 1st, 2009. Data collection will include: demographics (age, gender, weight), indication for use, serum creatinine, creatinine clearance (CrCl) using the Cockcroft Gault equation, bolus/infusion dose, adjustments for changes in serum creatinine, length of infusion, documented bleeding, platelet count and hemoglobin levels.

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

Learning Objectives:

Describe the role of platelets and GP IIb/IIIa inhibitors in acute coronary syndromes.

Identify appropriate usage and calculate bolus/infusion doses based on renal function.

Self Assessment Questions:

1. All of the following achieve antiplatelet activity through inhibition of the GP IIb/IIIa receptor except:

a. eptifibatide
b. abciximab
c. lepirudin
d. tirofiban

Total drug clearance of eptifibatide is _____ by approximately 50% in patients with CrCl <50 ml/min.
a. increased
b. decreased

EVALUATION OF THE UTILIZATION OF APREPITANT FOR POSTOPERATIVE NAUSEA AND VOMITING IN THE INPATIENT ADULT POPULATION

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Purpose: Postoperative nausea and vomiting (PONV) are common and troubling symptoms that can occur after procedures utilizing anesthesia. PONV can lead to clinical problems including dehydration, electrolyte imbalance, increased postoperative pain, opening of surgical wounds, hemorrhage, esophageal rupture and aspiration pneumonia. PONV has an economic impact by extending recovery room stay, delaying discharge from the hospital and increasing the number of unanticipated admissions of surgical patients. The primary objective of this study is to determine if combining aprepitant with other antiemetics in the preoperative period decreases postoperative use of rescue antiemetics.

Methods: This retrospective chart review will be performed on patients 18 years of age and older who received aprepitant before surgery from August 2007 to December 2009. A retrospective chart review will also be performed on patients 18 years of age and older who received surgery from August 2002 to December 2004, serving as a control group. This study will include the first 170 patients to meet criteria from the aprepitant group and the first 170 patients to meet criteria from the control group. Data collected will include: demographics; type and length of surgery; comorbities (hiatal hernia, obesity, smoking status, history of motion sickness or PONV); general anesthetic used (volatile anesthetic and/or nitrous oxide); preoperative and intraoperative antiemetics (dose, time and whether administration was appropriately timed); postoperative antiemetics (dose and time) and opioids out to 24 hours; incidence of nausea and vomiting at 0-2 hours, 2-6 hours, and 6-24 hours postoperatively; PACU length of stay; Apfel score (smoking status, history of motion sickness or PONV, general anesthesia, postoperative opioid use); and risk category (low-moderate risk for 0-2 risk factors or moderate-high risk for 3-4 risk factors).

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

Learning Objectives:

List the four Apfel score risk factors for postoperative nausea and vomiting.

Explain the purpose of a multi-modal approach to antiemetic therapy.

Self Assessment Questions:

Which of the following is not a complication of PONV?
a.Dehydration
b.decreased postoperative pain
c.aspiration pneumonia
d.electrolyte imbalance

T/FAprepitant selectively inhibits the binding of substance P, shows high affinity for NK1 receptors in the central nervous system, exhibits a long half-life, and has shown clinical efficacy against opioid-induced emesis.

CURRENT UTILIZATION OF STRESS ULCER PROPHYLAXIS IN THE INTENSIVE CARE UNIT

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Purpose:
Use of acid suppression therapy among patients admitted to the intensive care unit has increased, and both proton pump inhibitors and histamine-2 receptor antagonists are often used in patients at low risk for developing stress ulcers. These agents have recently been linked to development of hospital-acquired pneumonia and Clostridium difficile infection. The objective of this study is to determine the percentage of patients who receive these agents with appropriate indications for stress ulcer prophylaxis in the intensive care unit at our institution.

Methods:
This study will be submitted to the Institutional Review Board for approval prior to study initiation. The health systems electronic medical records and quality improvement data will be used to identify patients started on stress ulcer prophylaxis during admission to an intensive care unit. Patients who are admitted to the medical and surgical intensive care units will be included. Patients taking proton pump inhibitors or histamine-2 receptor antagonists as outpatient treatment for gastroesophageal reflux disease and other chronic conditions will be excluded. The following data will be collected: patient age, gender, indication for stress ulcer prophylaxis, acid suppressive agent prescribed, ventilator status, hepatic dysfunction, platelet count, INR, PTT, length of stay, number of days in the ICU, number of days on stress ulcer prophylaxis, APACHE II score, and occurrence of gastrointestinal bleeding. Data will be collected in order to protect patient confidentiality and will not include patient identifiers. Patients will be classified as low or high risk for developing gastrointestinal bleeding during admittance to the intensive care unit. The reviewers will consist of two pharmacists.

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

Learning Objectives:

Recognize current trends in prescribing of proton pump inhibitors and histamine-2 receptor antagonists in the intensive care unit.

Identify patient factors that may increase risk of developing clinically significant gastrointestinal bleeding.

Self Assessment Questions:

True or false: Stress ulcer prophylaxis should be prescribed to all patients in the intensive care unit.

Which of these have been associated with increased risk of GI bleeding in patients admitted to the intensive care unit?
a. Elevated INR
b. Chronic renal failure
c. Patient requiring mechanical ventilation
d. History of alcohol abuse
e. Sepsis
f. All of the above

EXTENDED-RELEASE MEDICATION INTERCHANGE PROTOCOL DESIGN, IMPLEMENTATION AND FINANCIAL IMPACT.

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Purpose: The purpose of this project is to maximize the efficient and cost-effective inpatient use of extended-release medications. The objectives for designing, implementing, and evaluating an extended-release medication interchange protocol are: 1) determining the historical use of extended-release medications within the institution, 2) creating a prioritized list of extended-release medications based on the amount of value potential and feasibility to convert, 3) developing a protocol and clinical directive for therapeutic interchange facilitated by pharmacists, 4) developing clinical decision support (CDS) tools in the electronic medical record (EMR) that supports the interchange protocol, and 5) measuring the financial impact of the interchange protocol.

Methods: A review of 12 months of purchasing records and non-formulary requests identified the overall use of extended-release medications. This list of medication is prioritized based on cost, frequency of use, and ease of conversion using Likert scales (1-5 point scale). All medications considered for interchange undergo a literature, pharmacist, and physician review. Development of the protocol includes background information and a conversion table for interchanging the medications in the form of a clinical directive. CDS tools like alternative alerts and navigators within the EMR will facilitate interchanges during patient admission and discharge. Alternative alerts can also be designed to report the number and types of interchanges to evaluate the protocol. All educational materials demonstrating changes and training are disseminated electronically and via in-services to all users. All methods for design and implementation of the protocol are subject to P & T approval. Every approved medication is evaluated for conversion compliance and direct extended-release to immediate-release cost-savings over 6 months.

Results: A description and assessment of the results will be presented.

Learning Objectives:

To explain the benefits of using an extended-release to immediate-release protocol.

To recognize the advantage of having a clinical directive to support an extended-release medication interchange protocol.

Self Assessment Questions:

True or False: Many studies economically justify using long-acting medications compared to their immediate counterparts due to enhanced compliance. This cost-savings is not necessarily true for inpatients

True or False: An extended-release to immediate-release protocol is cost-effective for many brand and generic medications.

IMPLEMENTATION OF A TECHNICIAN CHECKING PROGRAM AT AN ACADEMIC MEDICAL CENTER

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Purpose: Pharmacists working in the central pharmacy at Froedtert Hospital currently spend a majority of their time performing non-clinical pharmacy functions, including checking medications. Currently, technicians fill medications for a 24 hour cart fill and automated dispensing cabinet (ADC) replenishments. A pharmacist is responsible for performing the final check of these medications, an important but time-consuming task that limits the amount of time spent on clinical activities. A technician checking program allows specialty trained technicians to perform the final check on medications filled by another technician. Pharmacy literature has demonstrated these programs are as safe and effective as having a pharmacist perform the final check.

Methods: Data on the accuracy of pharmacists checking unit dose carts and ADC replenishments was gathered and workflow procedures were documented. A training packet, competencies and a simulated checking environment were created to properly train technicians. Data was collected on the accuracy of technicians checking unit dose carts and ADC replenishments. This information was reported to the Wisconsin Board of Pharmacy and a variance was received. A quality assurance procedure was created and will be put in place to continually monitor the accuracy of the technician checking program. Central pharmacists satisfaction will be measured pre and post implementation of the technician checking program. Quality assurance data will be collected for the duration of the program and reported to the Board of Pharmacy. The future vision for the program is to perform more frequent cart fills to aid in the prevention of missing medications.

Results/Conclusions: Technicians checking the cartfill and ADC replenishments achieved an accuracy rate exceeding the 99.8% accuracy rate required by the Board of Pharmacy. Data analysis is ongoing; results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Describe the benefits of implementing a technician checking program.

Explain changes to the pharmacist and technician workflow after implementing a technician checking program.

Self Assessment Questions:

What accuracy rate for checking medications must be maintained by technicians at Froedtert Hospital?

List two benefits of a technician checking program.

OUTCOMES OF CEFTRIAXONE USE IN METHICILLIN SUSCEPTIBLE STAPHYLOCOCCUS AUREUS (MSSA) BLOODSTREAM INFECTIONS

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Purpose:
Staphylococcus aureus is one of the leading causes of both community-acquired and hospital-acquired bacteremia. Empiric treatment for S. aureus bacteremia is usually based on the assumption that the isolate could be methicillin-resistant Staphylococcus aureus, therefore vancomycin is commonly initiated while awaiting culture results. If the culture grows MSSA, treatment should be switched to an appropriate beta-lactam, nafcillin and cefazolin are the recommended agents. Although not first line therapy, ceftriaxone has also been utilized in the treatment of MSSA infections. At the Hines VA hospital, ceftriaxone is used frequently due to the large home infusion population and the ease of once daily dosing. The purpose of this research study is to evaluate the effectiveness of ceftriaxone for the treatment of MSSA bacteremias.

Methods:
The study will involve patients from the time period 1/2000-9/2009, who were treated with either ceftriaxone or standard of care therapy (SOCT) for an MSSA bacteremia. Charts will be reviewed from the onset of infection to 6 months after antibiotic completion. Patients who received either SOCT (nafcillin, cefazolin, or vancomycin) or ceftriaxone for greater than 50% of the treatment duration will be included. Patients will be excluded if they were treated with an antibiotic other than the SOCT or ceftriaxone, or if they had a polymicrobial bacteremia. Data collection will include demographics (age, gender), indication for therapy, source of bacteremia, length of hospital stay, antibiotic regimen and duration of use, adverse reactions experienced, imaging results (when evaluating osteomyelitis or wound infections), inflammatory markers (when evaluating osteomyelitis), whether the patient has any implanted devices and if so, if it was removed, whether the patient received treatment in the ambulatory setting, microbiologic and clinical outcomes, and mortality.

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

Learning Objectives:

Discuss the appropriateness of ceftriaxone for the treatment of MSSA bloodstream infections.

Recognize the standard of care agents utilized for the treatment of MSSA bloodstream infections.

Self Assessment Questions:

Which of the following is not considered a standard of care agent in the treatment of MSSA bloodstream infections?
a. Nafcillin
b. Tigecycline
c. Cefazolin
d. Oxacillin

T/F: Staphylococcus aureus is one of the leading causes of both community-acquired and hospital acquired bacteremia.

IMPLEMENTATION AND OUTCOMES OF A PHARMACY MANAGED CLINIC FOR VETERANS IN A SUBSTANCE ABUSE RESIDENTIAL REHABILITATION TREATMENT PROGRAM

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Purpose:
The purpose of this study is to evaluate the impact of a newly implemented pharmacy managed service in the Addictive Disorders Treatment Program (ADTP) at the William S. Middleton Veterans Medical Center. ADTP provides services to patients suffering from a variety of addictive disorders. One treatment option available is the Substance Abuse Residential Rehabilitation Treatment Program (SARRTP.) Patients receiving residential treatment may have a lapse in primary care services if their primary care provider is based out of a different facility. This often results in undesirable outcomes, including unnecessary emergency department (ED) visits or unaddressed medical needs. Additionally, these patients have often made significant lifestyle changes including alcohol cessation and dietary changes that can have a major impact on their chronic medical conditions. A pharmacy managed clinic was created for these patients to address medical issues as appropriate within the scope of the pharmacist.
Methods:
A retrospective chart review will be performed using the Computerized Patient Record System to assess outcomes of a newly implemented pharmacy managed clinic for SARRTP patients. Institutional Review Board approval will be obtained prior to data collection. Outcomes assessed will include number and purpose of ED visits, as well as number and type of pharmacist interventions. A list will be generated of ED visits for SARRTP patients for a six month period prior to the start of the pharmacy managed clinic and for a six month period following the initiation of the clinic. Differences in the number and purpose of ED visits between the two time periods will be compared. A chart review will be performed for all patients in residential treatment who received care from the pharmacy managed clinic. Number and type of pharmacist interventions will be assessed.
Results/Conclusions: Pending

Learning Objectives:

Describe the need for a pharmacy-managed clinic to provide services to patients undergoing residential treatment for substance abuse.

Identify interventions that can be made by a pharmacist in a medication management clinic.

Self Assessment Questions:

True or False: Patients who are in treatment for addictive disorders have often made significant lifestyle changes that can have an effect on laboratory values and chronic medical conditions.

Pharmacists providing medication management services to patients in treatment for addictive disorders may make the following interventions:
A. Identify appropriate and/or inappropriate pain medication options
B. Provide medication options for management of chronic disease states
C. Recognize anti-craving medication options
D. Offer education/counseling regarding lifestyle modifications
E. Provide medications and/or counseling for tobacco cessation
F. All of the above

COMPARISON OF DIABETIC OUTCOMES BEFORE AND AFTER THE TRANSITION TO HUMAN U-500 INSULIN FROM CONVENTIONAL INSULIN THERAPIES.

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Purpose: The purpose of the study is to compare the outcomes associated with the transition from conventional insulin therapies to human U-500 insulin at the William S. Middleton Veterans Memorial Hospital.
Methods: A retrospective chart review will be performed using the computerized patient record system (CPRS) at the William S. Middleton VA. The CPRS database will be searched for all patients that have had an active prescription for human U-500 Insulin 5 years prior to the date of IRB and R&D approval. Patients who will be included in this study will be those who carry a diagnosis of diabetes mellitus and have filled a prescription for U-500 insulin through the William S. Middleton VA. Patients excluded from this study will be those who have been on U-500 insulin for 3 months or less prior to data collection. Information extracted for this study will include: age, gender, weight, BMI, hemoglobin A1C%, total insulin dose, number of hypoglycemic episodes, number of diabetes related hospitalizations, adverse drug events related to U-500 use, changes in potassium levels, creatinine clearance, and presence of neuropathy and/or retinopathy. This information will be collected for an equal time period before and after the initiation of U-500 insulin.
Summary of Results: Results are pending

Learning Objectives:

Describe the potential benefits and risks of transitioning from conventional insulin therapy to human U-500 insulin.

Identify monitoring parameters after the transition to human U-500 insulin from conventional insulin therapies.

Self Assessment Questions:

Which of the following are appropriate monitoring parameters after transitioning to human U-500 insulin?
A. Number of hypoglycemic episodes
B. BMI
C. Hemoglobin A1C%
D. All of the above

True or False? A patient would be a good candidate for conversion to U-500 insulin when daily insulin dose requirements exceed 200 units.

ASSESSMENT OF WORKLOAD AS IT RELATES TO HEALTH DISPARITIES IN PHARMACIST-MANAGED ANTICOAGULATION CLINICS.

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Purpose: The United States Department of Health and Human Services states that health disparities add to the "burden of illness and death" experienced by American minorities, as compared to the general population. Patients with health disparities suffer from limited access to quality healthcare. Pharmacist-managed anticoagulation visits provide patients an opportunity to discuss general medical issues that may otherwise go unaddressed. The objective of this study is to examine the differences in the types and frequency of additional services provided by pharmacists as it relates to health disparities in anticoagulation clinics in an urban, predominantly minority population in comparison to a suburban, largely non-minority population. Our secondary objective is to evaluate the impact of these additional services on pharmacist workload.

Methods: This prospective observational cohort study was determined to be exempt by the Institutional Review Board for each institution. This 8 week study will assess the additional services provided to patients in an anticoagulation setting. All anticoagulation patients seen on Tuesdays and Thursdays during the 8 week study period will be included for analysis. Anticoagulation visits conducted over the phone will be excluded. The primary endpoint is the type of additional services provided and the frequency of additional services per patient. Additional services are any patient-centered services not considered usual anticoagulation care that is provided by the pharmacist both during clinic visits as well as outside clinic visit time. The secondary endpoints include the total number of patients seen per staffing hours over the 8 week study period, number of patients seen per day per staffing hours, number of no-shows, late and walk-in appointments per day.

Results: Data collection is ongoing. Results will be presented at the Great Lake Pharmacy Resident Conference.

Learning Objectives:

Describe the effect of health disparities on the general health of minority patients.

Recognize the impact of pharmacy-managed anticoagulation clinics in addressing health disparity issues.

Self Assessment Questions:

True/False: Limited access to care and substandard quality of care leads to increased, morbidity, mortality, and prevalence of disease among U.S. minorities.

Which of the following patient populations is/are commonly affected by health disparities?
a)Women
b)Patients with disabilities
c)Hispanic Americans
d)Patients from rural locations
e)All of the above

PHARMACIST MEDICATION RECONCILIATION AND EDUCATION PRIOR TO HOSPITAL DISCHARGE TO AMBULATORY CLINICS.

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Purpose: As patients transition across healthcare settings, lack of communication has been identified as a major cause of adverse drug events. By reviewing medication profiles at discharge, pharmacists may be able to reduce medication-related problems that occur during this transition.
Methods: A prospective, case-controlled study was designed to evaluate the effectiveness of pharmacist intervention at discharge. This study design was approved by the Institutional Review Board at St. Ritas Medical Center. Patients referred to the Health Management Group, pharmacist managed ambulatory clinics, were randomized upon referral to the clinics. In the study group, medications for patients being discharged from the hospital were prospectively reviewed by a pharmacist. Concerns with the medication list were addressed. The pharmacist also educated the patient about changes to their home medication list. All interventions were documented in the hospitals electronic medical record. Patients in the control group received the current standard of care: medication reconciliation performed by their physician at discharge and patient education by their nurse. Patients in both groups were evaluated by a pharmacist on initial presentation to the clinic following their inpatient discharge. Medication errors identified were documented in the medical record. Further evaluation was performed using a standard question set to aid in identifying additional interventions required due to a medication error (call or visit to physician, medication discontinuation, etc.) Also documented were calls from patients to clinic staff resulting from or related to medication errors/near misses, as well as readmissions to the hospital before returning to the clinic. Total medication errors in both groups will be compared statistically using a Chi-squared test.
Results/Conclusions: To be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Discuss methods for pharmacists to increase patient safety as patients transition from an inpatient hospital setting to outpatient clinic setting.

Identify opportunities for improving medication reconciliation and patient understanding of new drug therapies upon hospital discharge.

Self Assessment Questions:

Which National Patient Safety Goal established by The Joint Commission addresses medication reconciliation across the continuum of care?

True or False: A common barrier to patient adherence to discharge instructions is inadequate or incomplete patient education.

EFFECT OF INSTALLATION OF A NOVEL COMPUTERIZED CHEMOTHERAPY ORDER-PROCESSING SYSTEM ON PHARMACIST SERVICE, PRODUCTIVITY, AND SAFETY.

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Purpose:
Processing of chemotherapy orders is a complex process that has several challenges pertaining to timely delivery and accurate compounding. Pharmacist double-checks prior to technician preparation of chemotherapy products is a mandatory part of the process. The current workflow at a large, tertiary care hospital for processing chemotherapy orders involves a manual process for transcribing patient information, including laboratory values, demographics, chemotherapy order information, and an independent pharmacist double-check system. This is ensured by creating paper "work cards", which are used by the admixtures technician and pharmacist to guide compounding. The objective of this study is to measure the effect of installation of a novel computerized chemotherapy processing tracking system on pharmacist service, productivity, and safety.

Methodology:
Investigational Review Board approval will be obtained prior to commencement of this study. A computerized database will be built by the investigator to capture and track all information that is currently maintained on the previously mentioned paper "work cards", including patient name, medical record number, account number, date of birth, height, weight, white blood cell count, absolute neutrophil count, platelets, serum creatinine, total bilirubin, chemotherapy ordered, dose ordered, total doses in regimen, and chemotherapy regimen. The database will be used to generate "work cards", which will be used in the admixture process as done previously. The database will maintain all information entered, and will be searchable and traceable.

Results:
Three endpoints will be measured: 1) Service to pharmacists, as measured by satisfaction surveys of the current and new chemotherapy-entry process. 2) Productivity, as measured by recording processing time with both manual and the computerized system. 3) Safety, as measured by analysis of completion percentages of work cards sampled from the manual and computerized system. Outcomes will be analyzed to identify areas of improvement for the computerized system and/or chemotherapy processing.

Conclusions:
In progress.

Learning Objectives:

Describe a unique technological solution for improving chemotherapy admixture workflow.

Outline pharmacist service, productivity, and safety endpoints of installation of the chemotherapy work card database.

Self Assessment Questions:

What obstacles are encountered with use of paper-based chemotherapy work cards?

What advantages does a database such as this provide to workflow?

INCIDENCE AND MANAGEMENT OF ARTHRALGIAS IN BREAST CANCER PATIENTS TREATED WITH AROMATASE INHIBITORS IN AN OUTPATIENT ONCOLOGY CLINIC

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Purpose:
Aromatase inhibitors (AIs) are routinely used as first line adjuvant treatment of breast cancer in postmenopausal women with hormone receptor positive tumors. The current recommended length of treatment with an AI is five years. Arthralgias are a common adverse event related to treatment with AIs, and they have been frequently cited as the primary reason for discontinuation of AI therapy. Various treatment strategies are proposed in literature but a standardized treatment algorithm has not been established. The initial purpose of this retrospective chart review was to describe the incidence and management of AI-induced arthralgias in patients treated at Kellogg Cancer Centers (KCC). Further evaluation led to the development and the implementation of a physician-driven treatment algorithm and electronic medical record (EMR) documentation tools.
Methods:
The retrospective chart review included adult patients with hormone receptor positive breast cancer who were receiving adjuvant therapy with an aromatase inhibitor.
A multidisciplinary team including, oncology physicians, nurses and pharmacists met to develop a standardized treatment algorithm and corresponding EMR documentation tools.
Results/Conclusions:
The overall incidence of arthralgias at KCC was 48%. Of those patients with reported arthralgias, 88% were managed without a change in AI therapy. Of KCC patients, 32% were documented as having arthralgias within the first 6 months of therapy initiation. Patients who reported AI-induced arthralgias were younger than patients who did not report AI-induced arthralgias (61 vs. 65 years, p=0.002). There was no statistical difference in the incidence of arthralgias in patients with a history of chemotherapy (including taxane therapy) compared to those who did not receive chemotherapy (p=0.352). Of patients presenting with AI-induced arthralgias, 41% did not have physician-managed treatment documented in the EMR. A treatment algorithm and documentation tools were developed to assist physicians in the management and documentation of arthralgias in our patients.

Learning Objectives:

Describe the place in breast cancer therapy for aromatase inhibitors, the incidence of aromatase inhibitor-induced arthralgias and the impact of arthralgias on continuation of therapy.

Outline the types of treatment used for aromatase inhibitor-induced arthralgias.

Self Assessment Questions:

Aromatase inhibitors are prescribed for which types of breast cancer patients?
a.)Pre-menopausal women with early stage disease
b.)Pre-menopausal women with hormone receptor positive disease
c.)Post-menopausal women with hormone receptor negative disease
d.)Post-menopausal women with hormone receptor positive disease

Which statement regarding aromatase inhibitor (AI)-induced arthralgias is TRUE?
a.)AI-induced arthralgias never interfere with AI therapy
b.)AI-induced arthralgias are highly uncommon
c.)AI-induced arthralgias are the most frequently sited reason for discontinuation of AI therapy
d.)There is a "gold standard" of treatment for AI-induced arthralgias

DETERMINATION OF THE EFFECTS OF HUMAN LEUKOCYTE ANTIGEN MISMATCHING ON INCIDENCE OF BK VIRUS AND VIRAL OUTCOMES IN RENAL TRANSPLANT RECIPIENTS

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Purpose:

The purpose of this study is to determine if the number of HLA mismatches and any particular antigen mismatches are linked with a higher incidence of BKV viremia, subsequent nephropathy and graft failure in renal transplant patients. To date, it has been predicted through several trials that a high degree of HLA mismatch is a positive risk factor for the development of BKV viremia. However, there have been no studies specifically assessing rates of BKV viremia and HLA mismatch in a study population at high risk for rejection, but who are not at highest risk for BKV nephropathy. Ideally, the results of this study will be able to confirm findings of prior trials. Results may also be used to identify future renal transplants recipients who may benefit from pre-emptive reduction in the level of immunosuppression.

Methods:

This study is a retrospective review of patients that received a renal transplant between January 1, 2004 and December 31, 2008. All patients included had at least 6 months of follow-up data. The university medical center electronic database will be utilized to review the medical records of all the renal transplant patients from the specified time period. All patients with a diagnosis of BKV positive DNA PCR will be included in the primary analysis. From the remaining transplant patients in the pre-specified time period, BKV positive subjects will be matched to unaffected controls in a 1:1 scheme based on age, gender, ethnicity and transplant date. Patient, transplant and viral specific data will be collected. Data will be recorded without patient identifiers; patient confidentiality will be maintained.

Results and Conclusion:

A total of 482 patients received a renal transplant during the specified time period; BKV status was known in 393 patients (Positive n=66, Negative n=327). Further data collection and descriptive analysis are in progress.

Learning Objectives:

Identify positive risk factors for BKV viremia in renal transplant patients.

Describe the role of HLA mismatching as a risk factor for BKV and its effect on BKV nephropathy.

Self Assessment Questions:

Which of the following is NOT a risk factor for BKV viremia?
a.African American ethnicity
b.Male Gender
c.BK positive donor status
d.Older Age
e.All of the above are risk factors

True or False.

The study by Adawalla et al determined that in a primarily Caucasian population, a higher degree of HLA mismatch correlated with a higher incidence of BKV nephritis.

THE ASSESSMENT OF FOUR HYDRATION METHODS FOR THE PREVENTION OF CONTRAST INDUCED NEPHROPATHY.

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Purpose: The primary purpose of this investigation is to compare the rate of contrast induced nephropathy in patients receiving planned angiography, who are pretreated with IV 0.9% sodium chloride, IV 0.9% sodium chloride with oral n-acetylcysteine, IV sodium bicarbonate, or IV sodium bicarbonate with oral n-acetylcysteine. Methods: Charts of patients that received planned angiography with contrast between 01-01-2009 and 09-30-2009 were examined. Twenty-five charts for each of the four hydration groups were randomly selected and assessed for contrast induced nephropathy by comparing the baseline serum creatinine and post-procedure serum creatinine. Contrast induced nephropathy was defined as either an increase in serum creatinine greater than 25% or 0.5 mg/dL above baseline. Results: Data collection is still in progress. Results will be presented at Great Lakes Pharmacy Resident Conference. Conclusion: The data concerning hydration methods for contrast induced nephropathy are conflicting, and the best method for preventing contrast induced nephropathy has yet to be determined. The results from this review will be used to help determine the best method of contrast induced nephropathy for patients at Borgess Medical Center.

Learning Objectives:

Recognize the risk factors associated with developing contrast induced nephropathy.

Identify methods used in the prevention of contrast induced nephropathy.

Self Assessment Questions:

1.Which of the following is NOT a risk factor for developing contrast induced nephropathy?
a.Pre-existing renal dysfunction
b.Amount of contrast media used
c.Serum creatinine < 1 mg/dL
d.Dehydration

TRUE or FALSE: Hydration with sodium bicarbonate solution alone has been clearly shown to prevent contrast induced nephropathy.

EVALUATION OF AN ELECTRONIC REMINDER TO ADJUST INSULIN REGIMENS FOR NPO DIABETIC INPATIENTS

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PURPOSE: Diabetics on insulin are at an increased risk of hypoglycemia when they become NPO (nothing by mouth). An electronic reminder was added to the NPO diet order set at the Louis Stokes VA Medical Center on September 11, 2009 reminding providers to reduce basal insulin by 50% and discontinue prandial insulin when diabetics become NPO. Previously, these instructions appeared only when insulin was initially ordered. The primary objective is to determine if implementation of an electronic reminder in the NPO diet order set improves insulin prescribing practices among general medicine NPO diabetic patients. Secondary objectives are to: evaluate glycemic outcomes among patients who were appropriately adjusted versus those who were not, determine if larger percentage reductions in basal insulin doses correlate with fewer hypoglycemic episodes, and explore current nursing practices.

METHODS: General medicine diabetic inpatients with an NPO diet order and concurrent basal insulin order between April 11, 2009 and February 11, 2010 will be eligible for retrospective chart review. Fifty patients prior to and 50 patients after implementation of the electronic reminder will be evaluated. Patients will be excluded if they were NPO less than twelve hours, had a previous NPO order during the same admission which met all inclusion criteria, or received enteral or parenteral nutrition while NPO. A Chi-square test will be used to compare the proportion of NPO patients who had their basal insulin dose reduced before and after implementation of the electronic reminder. The proportion of patients who had their prandial insulin discontinued before and after the electronic reminder will also be compared. Point-of-care blood glucose readings and Bar Code Medication Administration data will be collected to evaluate glycemic outcomes among these patients and to characterize current nursing practices.

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

Learning Objectives:

Explain methods to reduce hypoglycemia when a diabetic patient becomes NPO.

Describe an electronic intervention to improve insulin use in diabetic patients who become NPO.

Self Assessment Questions:

True or False: Basal insulin (NPH, glargine) should be held when a diabetic patient is NPO.

True or False: Prandial insulin (regular, aspart) should be held when a diabetic patient is NPO.

TIOTROPIUM EFFECT ON REDUCTION OF EXACERBATIONS (TERE) IN A VETERAN POPULATION: A PHARMACOECONOMIC RETROSPECTIVE REVIEW

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PURPOSE
The purpose of this study is to describe the effect that addition of tiotropium has on a veteran population with respect to number of yearly exacerbations and cost.

METHODS
This retrospective review will be conducted at the Jesse Brown Veterans Affairs Medical Center (JBVAMC). The resident investigator, Thani Misra, will be conducting the review under the supervision of the principal investigator, James Duvel. Patients are eligible for inclusion if they were dispensed their first prescription between 10/01/05 and 09/30/07. Evaluation of data will be from 10/01/04 and 09/30/08 Patients will be excluded if they are diagnosed with heart failure, have active tuberculosis, blood eosinophil count > 0.4 x 103/µL, or have active lung cancer. This study will include approximately 500 patients.

Primary endpoints: decrease in the number of exacerbations over a given year and cost associated with exacerbations. Secondary endpoints include the use of additional agents to control COPD.

RESULTS:
This research is in the data collection phase. Final results with conclusion will be presented at the Great Lakes Pharmacy Conference.

CONCLUSIONS:
No conclusions have been outlined at this time. After data collection is complete an analysis of the data and conclusions will be discussed at that time.

Learning Objectives:

Describe the effect tiotropium has on exacerbation rates.

Describe the pharmacoeconomic impact of tiotropium to a patient regimen.

Self Assessment Questions:

True or False: Tiotropium is primarily indicated for patients with asthma

True or False: Tiotropium and ipratropium are appropriately and commonly prescribed together

EVALUATION OF APPROPRIATENESS OF ERYTHROPOIETIN-STIMULATING AGENTS IN A 400 BED TERTIARY CARE MEDICAL CENTER

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Purpose: Hillcrest Hospital currently has no monitoring or restrictions on ESA usage for inpatients, with the exception of a Pharmacy and Therapeutics approved auto-substitution from epoetin alfa to darbepoetin alfa, the formulary preferred agent. The purpose of this study was to assess if pharmacist monitoring and intervention of ESA orders increased compliance with current safety guidelines.

Methods: A prospective pilot study was conducted over three months. A pharmacist reviewed all orders prior to dispensing and data was compared to historical data of a similar time frame. A pharmacist called physicians to confirm necessity of ESA use in patients with hemoglobin concentrations above defined target ranges. Orders received after 6 PM were processed the following day. All inpatient adult ESA orders were included while all outpatient ESA orders were excluded. Our primary outcome was rate of change in inappropriate orders. Secondary outcomes assessed change in pharmacist auto-substitution from epoetin alfa to darbepoetin alfa and change in overall darbepoetin alfa use. Nominal data was analyzed with Chi-square using Sigma Stat 3.5 software. Descriptive data analysis included appropriate, inappropriate, and total number of orders by discipline. The number of epoetin alfa versus darbepoetin alfa orders, as well as DAW orders, was assessed by discipline.

Preliminary Results: A retrospective review of 4th quarter 2008 data showed 5% of ESA orders were given to patients with a hemoglobin concentration above the target range used for this study. Pharmacy auto-substituted darbepoetin alfa for epoetin alfa in 41% of possible cases.

Conclusions: Results to be presented at Great Lakes Residency Conference.

Learning Objectives:

Recognize target hemoglobin concentrations based on indication for use.

Identify potential areas for pharmacist impact on optimizing ESA usage.

Self Assessment Questions:

True or False FDA black box warnings for ESA use in chemotherapy-induced anemia recommend only using in patients receiving chemotherapy with curative intent.

Per the National Kidney Foundation, the clinical recommendation for hemoglobin concentrations in patients with chronic kidney disease (dialysis and non-dialysis) is not to exceed a level of _____.
a.10.0 g/dL
b.11.0 g/dL
c.12.0 g/dL
d.13.0 g/dL

COHORT STUDY OF THE IMPACT ON WEIGHT USING TWOCAL HN VS. THE STANDARD OF CARE (ENSURE).

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Purpose: Malnutrition in the elderly population can be caused by physiological conditions, cognitive impairment and other co-morbidities which can then lead to poor outcomes. The objective of this study is to determine if TwoCal HN (containing 2 Cal/mL and high nitrogen) has a more pronounced effect than the standard of care (Ensure) on weight in long-term care patients who are not eating or have had substantial weight loss.

Methods: Prior to commencement, this study will be submitted to the Institutional Review Board for approval. Patients receiving TwoCal HN for 90 days will be compared to patients receiving Ensure for 90 days and will be identified by the Veterans Affairs electronic medical record system. All results will be determined exclusively through retrospective electronic chart review by the Veterans Affairs electronic medical record system. Change in weight in patients receiving TwoCal HN for 90 days will be compared to the change in weight in patients receiving Ensure for 90 days. Inclusion criteria will be age greater than 18 years and use of TwoCal HN or Ensure. Patients who discontinue the MNS prior to day 90 will be excluded. Hospice patients will also be excluded. All data that is collected for this study will be maintained confidentially.

Results/Conclusions: Data collection will commence after approval. Available results and conclusions will be presented at Great Lakes Residency Conference.

Neither author has conflict of interest information to disclose.

Learning Objectives:

Discuss the potential consequences of malnutrition.

Identify various measures of nutritional status.

Self Assessment Questions:

Which of the following is/are associated with malnutrition?
A.Increased morbidity and mortality
B.Decreased risk of pressure ulcer development
C.Increased risk of infections
D.A and C
E.All of the above

Prealbumin is more useful for detecting changes in short-term nutritional status than albumin. True or False

APPROPRIATE MONITORING OF ADVERSE METABOLIC EFFECTS IN A VETERAN POPULATION TREATED WITH ATYPICAL ANTIPSYCHOTICS

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This retrospecitve study will determine the extent that the Cincinnati VAMC is monitoring hemoglobin (Hgb) A1c, weight, and lipids in patients prescribed clozapine, olanzapine, quetiapine, risperidone, aripiprazole, and ziprasidone based on the American Diabetes Association Guidelines, American Psychiatric Association Guidelines, and the Veterans Integrated Service Network (VISN) 10 2008 critical performance monitor.

All patients prescribed an atypical antipsychotic from October 1, 2006 to June 30, 2009 will be evaluated for inclusion. Patients will be excluded for receiving an atypical antipsychotics prescription within 12 months prior to baseline or for having a diabetes diagnosis and/or a Hgb A1c >6.5% at baseline. For the primary endpoint, patients will be evaluated at baseline (within 6 months prior to starting the atypical antipsychotic) and at 3 to 6 months to determine if appropriate monitoring of Hgb A1c, weight, and lipids was performed. Patients without all three readings at baseline and at 3 to 6 months will be considered inappropriately monitored. Three secondary endpoints will be evaluated. First, patients will be evaluated for a significant increase in Hgb A1c and/or weight at 3 to 6 months. Second, results for the 3 monitoring parameters will be evaluated separately to determine the rate of appropriate monitoring for each parameter. Finally, the rate of baseline Hgb A1c monitoring will be evaluated prior to and after initiation of the VISN 10 critical performance monitor.

The results of the study identified 1384 veterans newly started on atypical antipsychotics. Of these, 213 patients were excluded for having baseline diabetes diagnosis and/or Hgb A1c > 6.5% and 439 patients were excluded for not receiving the medication for at least 3 months. The remaining 732 patients are currently being evaluated according to the primary and secondary endpoints. At this time, no conclusions can be drawn as results are still being collected and evaluated.

Learning Objectives:

To describe the metabolic adverse effects that are associated with atypical antipsychotics and current monitoring recommendations

To discuss the results and clinical implications of how the Cincinnati VAMC monitors metabolic adverse effects in patients receiving atypical antipsychotics

Self Assessment Questions:

When do most patients develop diabetes after initiation of an atypical antipsychotic?
a.Within 3 to 6 months of treatment
b.Within 3 to 6 weeks of treatment
c.Within 6 to 9 months of treatment
d.Within 6 to 9 weeks of treatment

Which of the following statements about monitoring metabolic side effects of atypical antipsychotics is true?
a.The American Diabetes Association and the American Psychiatric Association developed guidelines for monitoring atypical antipsychotics in 2004
b.Recommended monitoring parameters include weight, BMI, fasting plasma glucose, hemoglobin A1c, fasting lipids, waist circumference, and blood pressure
c.Adherence to these guidelines has generally been poorly executed
d.All of the above

IMPROVING PEDIATRIC MODERATE SEDATION

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PURPOSE: Although moderate sedation is common practice with pediatric patients, obtaining appropriate levels of sedation while minimizing adverse events and over sedation is often difficult. Studies have demonstrated failure to achieve or maintain appropriate levels of sedation 25 to 50% of the time. The purpose of this study is two-fold. Initially, the efficacy of current moderate sedation policy and practices at Toledo Childrens Hospital will be evaluated. Then, revisions to the policy and practices will occur if warranted and pre-printed order sets will be developed.

METHODS: Patients requiring moderate sedation for completion of non-painful procedures between September 1, 2009 and October 31, 2009 will be included. Data will be collected retrospectively from patients charts and computer records, and will include patient demographics, type and length of procedure, sedation medication received, achievement of appropriate levels of sedation or failure to achieve adequate sedation, limitations of images obtained due to motion, duration of sedation following the test, occurrence of adverse events and any symptomatic treatment utilized. For each sedation and symptomatic management agent used, dose, route, frequency, and number of doses received will be recorded. In order to evaluate the appropriateness of current polices and medication selection, current literature evaluating the safety and efficacy of sedation medications in pediatric patients will be reviewed and analyzed.

PRELIMINARY RESULTS: Data has been analyzed for 21 patients. Pentothal was the most common sedation medication utilized and accounted for three out of the four sedation failures. All three patients receiving chloral hydrate achieved a sedation level of 4. Two patients received midazolam, only one received a sedation level of 3 or higher. Thirteen of the sixteen patients receiving pentothal achieved a sedation level of 3 or higher. A sedation level of 5 was not observed with any medication regimen and no adverse events were reported.

Learning Objectives:

Describe the challenges associated with moderate sedation in pediatric patients.

Explain the advantages and disadvantages of the different medication regimens.

Self Assessment Questions:

Which of the following medications was associated with the greatest number of sedation failure?
a.Chloral hydrate alone
b.Pentothal alone
c.Fentanyl plus midazolam
d.Chloral hydrate plus midazolam plus morphine

Which of the following medication regimens are associated with the greatest number of adverse events?
a.Pentothal alone
b.Chloral hydrate alone
c.Fentanyl plus midazolam
d.Chloral hydrate plus midazolam plus morphine
e.C and D had similar rates of occurrence

SMOKING CESSATION CLASS ATTENDANCE AND ITS EFFECTS ON TOBACCO QUIT RATES

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Purpose
Tobacco cessation management strategies have evolved greatly over the last forty years. New pharmacologic therapy has been developed and proven to be effective in helping patients to quit. Current evidence suggests that counseling plays an important role in treatment success. Furthermore, the combination of pharmacologic treatment and counseling has been shown to be more effective than either one utilized alone. At the North Chicago VA Medical Center, (NCVAMC) a psychologist-run smoking cessation class is offered to patients to help them quit, but is not mandatory. However, the effectiveness of this class on tobacco outcomes remains unknown. The primary objective of this study is to identify the percentage of class completers who quit. This can help the VA to determine the value of this class and to develop more effective ways to manage their smoking patients.

Methods
This is a retrospective case-control study conducted at the NCVAMC from January 2007 to January 2009. Patients with orders for nicotine replacement therapy (gum, patch, or lozenge) or varenicline were included. Patients on bupropion therapy, with a history of schizophrenia, unwilling to quit, or have contraindications to NRT or varenicline were excluded. The primary endpoint is the percentage of patients who quit after completion of the smoking cessation class. The first secondary endpoint is the 7-day abstinence rates of class participants and non-participants, which will be assessed by $\chi 2$ analysis. Results will be expressed as an odds ratio with a confidence interval of 95%. The other secondary endpoint is the percentages of each pharmacotherapeutic agent used in patients who quit. In order to achieve 90% power and an alpha of 0.05, a total of 102 patients are needed for inclusion in the study.

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

Learning Objectives:

Explain the roles of counseling and drug treatment in the management of smoking cessation.

Name the available pharmacotherapy options for smoking cessation.

Self Assessment Questions:

Based on current evidence, which strategy has shown to produce the most treatment success in tobacco users?
a. Counseling
b. Pharmacotherapy
c. Both

All of the following are available dosage forms of nicotine replacement therapy EXCEPT:
a. Patch
b. Topical gel
c. Inhalation Device
d. Nasal spray

EASTERN KENTUCKY OPIATE USE FOR CHRONIC NON-MALIGNANT PAIN

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Purpose: Chronic non-malignant pain (CNMP) has many treatment options including non-pharmacologic methods, non-opioid analgesics, and opioid analgesics. The objective of this research is to determine if there are differences in the medication management of several CNMP conditions between patients enrolled in the Lexington Veterans Affairs Medical Center and Kentucky Medicaid Association (KMA) between January 1, 2004 and December 31, 2008.
Methods: A retrospective cross sectional review will be performed using the Veterans Integrated Service Network-9 Veterans Affairs Medical Centers Computerized Patient Record System (VISN-9 VAMC CPRS) and KMA databases. The study population will include persons over 18 years of age who were diagnosed with chronic pain, osteoarthritis, lumbago, migraine, or neuropathy between January 1, 2004 and December 31, 2008. Patients will be matched based on age, gender, diagnosis, and county of residence. Inclusion criteria: patients ≥ 18 years of age, diagnosed with chronic pain, chronic migraine headaches, osteoarthritis, lumbago, and/or neuropathy, and who are adherent to medication therapy (MPR >0.8); for KMA subjects: State of Kentucky Cabinet for Health and Family Services (CHFS) Medicaid recipients for minimum of 11 months. Exclusion criteria: diagnosis of malignancy or fibromyalgia; patients from the KMA population that were not continuously eligible for services between 2004 and 2008; the dose and duration of opiate therapy will be evaluated. Patients who utilize multiple opiates at the same time will be stratified based on level of usage. Medication possession ratio (MPR) will be calculated to estimate extent of medication compliance with MPR>0.8 defining adherence. Data will be analyzed using logistic regression. Continuous variables will be analyzed using t-tests, and categorical data will be analyzed with chi-square tests.
Significance: Study findings should provide further insight into the role of geographic population variables vs. health-system influences on the prescribing of opiate analgesics in chronic non-malignant pain.
Results: Pending

Learning Objectives:

Describe current recommendations for the pharmacological management of osteoarthritis, lumbago, neuropathy, and chronic migraine.

Recognize the differences in opiate medication management between the Lexington VAMC and KMA populations.

Self Assessment Questions:

Is an opiate analgesic appropriate first line to treat osteoarthritis?

Opiates may be considered when treating low back pain.

EVALUATION OF INHALED TOBRAMYCIN IN THE TREATMENT OF LATE-ONSET VENTILATOR-ASSOCIATED PNEUMONIA IN CRITICALLY ILL PATIENTS: THE IT-VAP STUDY

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Purpose:
Ventilator-associated pneumonia (VAP) is a common nosocomial infection with high mortality if adequate empiric antibiotics are not initiated. Double coverage for the empiric treatment of multi-drug resistant Gram-negative bacilli often involves an aminoglycoside. Limited by pulmonary tissue penetration ~30%, inhaled aminoglycosides have emerged as an option for the direct administration to the site of infection. However, efficacy and safety data are limited for inhaled aminoglycosides in late-onset VAP. The purpose of the study is to evaluate morbidity and mortality associated with the use of inhaled tobramycin as empiric double coverage for VAP.

Methods:
This is a single-center, retrospective study of adult critically ill patients admitted to a surgical intensive care unit who received adequate empiric VAP treatment. Patients will be divided into three groups: 1) Beta-lactam plus inhaled tobramycin; 2) Beta-lactam plus intravenous tobramycin; or 3) Beta-lactam monotherapy. Patients in the Beta-lactam plus inhaled tobramycin group will be matched to each control arm. The specific aims are to evaluate the 96-hour and overall clinical response and microbiologic cure rate, morbidity, mortality, and safety of inhaled tobramycin for the beta-lactam plus inhaled tobramycin compared to the other groups. The primary outcome measures are the percent change in CPIS at 96 hours and the proportion of patients with a decrease in CPIS score by at least two points and below a total CPIS of five points at 96 hours. Secondary outcomes include clinical and microbiologic cure rates; reinfection after 48 hours from treatment discontinuation; ICU and hospital lengths of stay; duration of mechanical ventilation; and in-hospital mortality. Safety outcomes include the incidence of nephrotoxicity and bronchospam.

Results / Conclusions:
Data collection and evaluation are currently being conducted and will be presented at the conference.

Learning Objectives:

Describe ventilator-associated pneumonia and the importance of adequate empiric antibiotic therapy.

Discuss the theory for using inhaled aminoglycosides in the treatment of ventilator-associated pneumonia.

Self Assessment Questions:

Which of the following is true about VAP?
a.Incidence between 10%-65%
b.Mortality rate between 30-70%
c.Increases length of stay by 7-9 days per patient
d.A delay in adequate empiric antibiotics is associated with worse in-hospital mortality
e.All the above

Which of the following statements is true concerning the theory for the use of inhaled aminoglycosides in VAP?
a.Achieve higher minimum inhibitory concentrations at the site of infection using inhaled antibiotics
b.Increased risk of aminoglycoside-induced renal dysfunction
c.Decreased systemic exposure to the medication can increase the risk of breeding antibiotic resistance
d.Instilled antibiotics reach deeper pulmonary tissue than nebulized antibiotics
e.All of the above

UTILIZATION OF A REMINDER MAILING TO IMPROVE BLOOD GLUCOSE LOG REPORTING IN AN OUTPATIENT DIABETES CLINIC

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Background: Improving glycemic control has been proven to reduce complications in diabetic patients. Self-monitored blood glucose (SMBG) is a strategy that is widely-used to achieve this goal. However, if patients are unwilling or unable to make therapy adjustments in response to SMBG readings, or if SMBG readings are unavailable to clinicians, this strategy will have a limited impact.

Purpose: To assess the impact of a reminder mailing on response rates to requests for SMBG logs.

Methods: Adult diabetic patients were recruited from the Internal Medicine Center of Akron (IMCA) Diabetes Management Clinic at the time a request for an SMBG log was made from December 2009 through February 2010. Patients who did not have a mailing address or who were not independently managing their disease were excluded. The following data were collected: date of recruitment, patient demographics, date of first diabetes clinic visit, concomitant medical conditions, most recent hemoglobin A1c, and anti-diabetic medication list. After recruitment, a reminder mailing was sent to these patients one week before their SMBG logs were to be returned to the clinic. These patients were compared with patients seen at the IMCA diabetes clinic during a period when a reminder mailing was not utilized, using a retrospective chart review. The primary outcome is the proportion of all SMBG logs returned on-time. Secondary outcomes include the percentage of SMBG logs that are returned, the percentage fulfilled, the percentage of diabetes clinic appointments kept, and the number of interventions made to anti-diabetic therapy.

Results: Twenty SMBG requests were made during the retrospective cohort, of which ten were returned and three were fulfilled. Baseline characteristics of these 19 patients include 58% male gender, 53% Caucasian ethnicity, average hemoglobin A1c of 9%, and 95% insulin-dependency. Data collection for the prospective cohort is pending, and will be presented at the conference.

Learning Objectives:

Discuss the importance of SMBG in the management of diabetes

Define the role of reminder mailings in the management of diabetes in the outpatient setting

Self Assessment Questions:

Diabetes affects over 23 million people in the United States alone. (True/False)

SMBG has been shown to provide feedback on the impact of nutrition, physical activity and changes in anti-diabetic therapy. (True/False)

EVALUATION OF IMMUNOFIXATION VERSUS SERUM FREE LIGHT CHAIN MEASUREMENT AS A SURROGATE BIOMARKER FOR BONE MARROW RESPONSE TO FIRST INDUCTION THERAPY PRIOR TO MOBILIZATION IN PATIENTS WITH MULTIPLE MYELOMA

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Background/Purpose:
Prior to the mid-1990s, combination therapy with melphalan and prednisone was the standard treatment for patients with multiple myeloma. Since then, studies have demonstrated the benefit of autologous stem cell transplant (ASCT) in this population, with patient outcomes closely linked to their response to induction therapy. Patients undergoing induction therapy with novel agents such as thalidomide, lenalidomide, and bortezomib have demonstrated improved responses following transplant compared to conventional chemotherapy.

Historically, diagnosis, prognosis, and response to treatment have been done through serial measurement of intact immunoglobulins (Ig) via urine and serum immunofixation electrophoresis (IFE). The definitive response to induction therapy is established via bone marrow biopsy prior to mobilization and ASCT. In some cases, the percentage of plasma cells in the bone marrow does not correlate with favorable immunofixation results. In these patients, serum free light chain (sFLC) levels may be a better surrogate biomarker to monitor clinical response to induction therapy.
The purpose of this study is to evaluate the role of serum free light chains versus immunofixation as a surrogate biomarker of response to first induction therapy prior to mobilization in multiple myeloma patients proceeding to ASCT.

Methods:
A retrospective chart review of multiple myeloma patients who received thalidomide, lenalidomide, and/or bortezomib as induction therapy prior to ASCT from Jan 2006 until December 2009 will be evaluated. Patients will be stratified by regimen, cytogenetics, and ISS stage at diagnosis. Data collection will include agent(s) and number of cycles of induction therapy received, response and duration of response to induction therapy, serum free light chain levels, immunofixation results, and percentage of plasma cells within the bone marrow at diagnosis and periodically following induction therapy.

Results/Conclusions
Results and conclusions will be presented at the conference.

Learning Objectives:

List the three novel agents used as induction therapy prior to stem cell transplant in patients with multiple myeloma

Discuss the limitations of the different ways to monitor disease response to induction therapy

Self Assessment Questions:

T/F: Melphalan is the preferred agent to use as induction therapy in transplant-eligible patients.

T/F: Serial measurement of intact immunoglobulins in the urine and/or serum always correlates with disease response within the bone marrow.

PILOTING PHARMACY SERVICES IN A PALLIATIVE CARE CLINIC

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PURPOSE

It is recognized that a patients quality of life is improved through pharmaceutical care and pharmacist consultation. Medication therapy is the mainstay of most symptom control and pain management in palliative care patients. For this reason, pharmacists have a pivotal role in the provision of palliative care. The objective of this research is to establish a pharmacist role within a palliative care outpatient setting of a Veterans Affairs Medical Center where both patient care and cost savings are realized.

METHODS

A pharmacy resident will join the palliative care multidisciplinary team to assess pharmacy-related needs and address areas of opportunity for pharmacist intervention. The following pharmacist responsibilities will be implemented where necessary: medication reconciliation procedures, evaluation for duplicative and interacting medications, assessment of appropriateness of medication orders, providing recommendations for therapeutic options, and offering drug information as a pharmacy resource. A scope-of-practice in a collaborative care context will be developed based on the above implementations. The research gathered will be incorporated into an administrative, business plan design to demonstrate areas of potential patient care improvement and cost-effectiveness of related palliative care pharmacotherapy.

RESULTS

Preliminary results, based on discussion with the palliative care team, illustrated pharmacy-related needs and thus, pharmacy intervention is warranted. In addition, patient care benefits are being realized according to subjective satisfaction statements relayed to members of the palliative care team. Final results will be presented at the Great Lakes Conference pending completion of data collection.

CONCLUSION

Conclusions will be presented at the Great Lakes Conference pending completion of data evaluation.

Learning Objectives:

Discuss the need for clinical pharmacy input as a constituent of the approach in achieving comprehensive palliative care services.

Describe the financial implications a palliative care pharmacist may have in a Veterans Affairs outpatient clinic.

Self Assessment Questions:

The Clinical Practice Guidelines for Quality Palliative Care include recommendations for pharmacy involvement in the provision of palliative care. T or F.

Which of the following is NOT a cost avoidance intervention?
a. Preventing drug interactions
b. Adjusting medication dosages
c. Duplicating therapy
d. Providing recommendations for formulary therapeutic options

FORMALIZATION OF AN OUTPATIENT PARENTERAL ANTIMICROBIAL THERAPY (OPAT) PROGRAM AND IMPACT ON PATIENT SATISFACTION AND CLINICAL OUTCOMES AT A VETERANS AFFAIRS MEDICAL CENTER

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PURPOSE:

The Infectious Diseases Society of America (IDSA) guidelines for OPAT as well as the American Society of Hospital Pharmacists (ASHP) guidelines on the pharmacists role in home care support the implementation of communication techniques with patients in an OPAT program. The primary objective of this project is to assess the impact of a more formalized OPAT program, which incorporates enhanced communication techniques, on patient satisfaction.

METHODS:

The first phase of the project will consist of implementing a more formalized OPAT program. This phase will involve developing patient handouts and materials, which will be given to the patients prior to discharge from the hospital. This phase will also involve implementation of more formalized communication techniques, including once weekly phone calls to the patients to assess for any problems, adverse drug reactions, or issues with compliance. The second phase of the project will consist of distribution of pre and post implementation patient satisfaction surveys and clinical outcome data collection. Surveys will be distributed to patients who received OPAT within one year prior to implementation as well as to any patient receiving OPAT following implementation. The surveys will be used as a tool to compare patient satisfaction before and after implementation. Data collection will be performed by completing retrospective chart reviews using the computerized patient record system (CPRS) and will involve assessing for patient compliance, adverse drug reactions, and clinical status of infection in both the pre and post implementation groups. The primary outcome of the study will be determination of patient satisfaction after formalization of the OPAT program. Secondary outcomes will include incidence of adverse drug reactions, patient compliance, and clinical status of infection after completion of antibiotic therapy.

RESULTS/CONCLUSION:

Research is in the data collection phase. Final results and conclusion will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Explain the potential benefits of providing OPAT compared to prolonged hospitalization for intravenous antibiotic therapy

Identify areas for improvement in communication techniques within an OPAT program

Self Assessment Questions:

True or False: The IDSA guidelines for OPAT do not support the implementation of communication techniques for patients in an OPAT program.

Which of the following can be considered potential benefits of providing OPAT?
a.Cost savings
b.Improved patient satisfaction
c.Improved patient quality of life
d.Reduced risk of nosocomial infections
e.All of the above

PAIN MANAGEMENT AND PERCEPTIONS: A SURVEY OF HOSPITALISTS, NURSES, PHARMACISTS AND PHYSICIAN RESIDENTS

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Purpose
The purpose for this project is to determine which factors, including demographics, perceptions and profession, influence the way pain medications are managed at our institution. The results of this survey will facilitate the identification of educational opportunities regarding misperceptions and knowledge deficits amongst multiple disciplines in pain management.

Methods
Eligible participants are actively employed hospitalists, nurses, pharmacists and physician residents at Henry Ford Hospital. Surveys that have 3 or more unanswered questions will be excluded from data analysis and be rendered incomplete. The survey will be administered using an online survey software tool (Zoomerang, MarketTools, Inc.) and will be accompanied by a cover letter via electronic mail to the respective department head including a request that the survey be forwarded to their employees. The survey is comprised of three sections. The first section includes case-based questions focusing on practical application of pain management. This section is followed by perception questions that ask the survey respondent about addiction, drug-seeking, opioid potency and comfort with providing pain medications. The third section focuses on demographic information including the following, occupation, age, years in practice, sex, ethnicity and location of professional education. Content validation will be accomplished by distributing the survey to pharmacy students whose responses will not be included in data analysis. Contact information for each of the study populations will be obtained by contacting the respective departments. A reminder will be sent via electronic mail two weeks and again at one month following survey distribution to encourage greater participation. Data will be analyzed and presented using descriptive statistics. A possible limitation of this study is a low survey response rate.

Results: Data analysis will commence, pending study participant survey responses

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

Learning Objectives:

List factors that may influence how pain medications are managed.

Identify specific areas where pharmacists can have an impact on the improvement of pain management.

Self Assessment Questions:

True or False Perceptions of pain management do not influence how pain is treated.

True or False Pharmacists can have an impact on pain control by promoting appropriate pain management.

PRESCRIBING PATTERNS OF PPIS IN PATIENTS REQUIRING CLOPIDOGREL POST DRUG ELUTING STENT

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Objectives: There is growing concern that concomitant use of clopidogrel and proton pump inhibitors (PPIs) may decrease the anti-platelet effects of clopidogrel and/or increase the risk of thrombosis after placement of a drug-eluting stent (DES). The proposed mechanism for this interaction involves interference of clopidogrel activation via cytochrome P450 inhibition associated with PPIs. The objective of our study is to determine the appropriateness of PPI prescribing in patients receiving clopidogrel following implantation of a DES at the University of Illinois Medical Center at Chicago (UIMCC) and to investigate the impact on clinical outcomes.

Methods: A retrospective chart review of adult patients who received a DES beginning September 1, 2006 until September 1, 2008 plus one year follow-up was conducted. Data collection included baseline demographics, timing of PPI, indication of PPI, PPI prescribed, past medical history, adverse cardiac and gastrointestinal (GI) events and concomitant medications.

Results: One hundred and seventy-six subjects were included in the study. Average age 61 + 11 years who received an average of 1.5 + 0.8 DES and 41% are female. Most common indication for a PPI was GERD (32%) followed by history of GI bleed (13%). Of the patients who received a PPI (n=62), a majority were prescribed a PPI prior to stent implantation (74%). Lansoprazole was prescribed 63%, omeprazole 21%, pantoprazole 8%, esomeprazole 6% and rabeprazole 2% of the time. Overall cardiac adverse events occurred in 26% of the patients, while 13% of the patients experienced a GI adverse event.

Conclusion: A majority of PPIs in this patient population were prescribed with an appropriate indication; however, 45% of the patients did not have an indication recorded in their medical chart. Final conclusion will be presented at Great Lakes Pharmacy Resident Conference pending outcome data analysis.

Learning Objectives:

Review current guidelines for PPI use status post drug eluting stent implantation in patients at high risk for gastrointestinal adverse events.

Identify the appropriateness of PPI use status post drug eluting stent implantation in patients receiving clopidogrel.

Self Assessment Questions:

T/F: Several studies have identified a potential drug interaction between clopidogrel and PPIs based on the proposed mechanism involving interference of clopidogrel activation via cytochrome P450 inhibition associated with PPIs.

T/F: In patients status post drug-eluting stent implantation at UIMCC, it was found that PPI's were prescribed most commonly before stent implantation.

VITAMIN K SUPPLEMENTATION IN WARFARIN PATIENTS WITH UNSTABLE INR: ASSESSMENT OF APPROPRIATE DOSE AND GENETIC PREDICTORS OF RESPONSE

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Purpose: The objective of this study is to determine if treatment with 200 micrograms of oral vitamin K1 will affect the percent time in therapeutic range (TTR) in patients with unstable INR response. A secondary objective is to determine if genetic differences in cytochrome P450 isoenzyme 2C9 (CYP2C9) or vitamin K epoxide reductase complex subunit 1 (VKORC1) correlate to differences in response to supplemental vitamin K1 therapy.

Methods: The study has been approved by the Institutional Review Board of Ohio Northern University. Patients were selected from an anticoagulation clinic in an internal medicine office. Inclusion criteria were: patients that were on warfarin for at least 6 months had a TTR <60%, and provided informed consent. After enrolling in the study, a buccal swab was obtained from each patient to asses for polymorphisms in CYP2C9 and VKORC1. Polymorphism assessment was performed and processed by gene microarray technology. Patients were asked to take 200 micrograms of oral vitamin K1 daily. Patients were advised to make no significant dietary changes. Adherence was verified by pill counts of vitamin K1 at each study visit. INR testing was conducted weekly until 2 consecutive INR values were within the therapeutic range (+ 0.2). INR was then monitored as necessary per office protocol. After 6 months of vitamin K1 therapy, percent TTR was calculated from study initiation to termination and compared to the TTR prior to study inclusion. Patients were given the option to continue vitamin K1 supplementation at the end of the study.

Preliminary Results: Currently 22 patients have been enrolled and 16 patients have completed the study. Among patients completing 6 months of vitamin K1 therapy, mean TTR at study initiation was 45.00% (+10.48%). TTR improved significantly (P=0.002) to 67.98% (+22.37%) after 6 months of vitamin K1 therapy.

Conclusions: to be determined

Learning Objectives:

Describe the current evidence and recommendations for the use of vitamin K supplementation in warfarin patients with an unstable INR response

Explain the effects of genetic variability related to the metabolism of warfarin and the activation of vitamin K

Self Assessment Questions:

True or False: According to the 2008 American College of Chest Physician(ACCP) guidelines, daily oral vitamin K supplementation is recommended in warfarin patients with a variable INR response.

What are some things to consider when using vitamin K supplementation in warfarin patients with a variable INR response?
a.Warfarin dose adjustments are usually unnecessary
b.Known causes of INR variability must be excluded
c.Daily doses of 2.5 to 5 mg of oral vitamin K should be used
d.Increased frequency of INR monitoring is not needed initially

EVALUATION OF AN ANTIBIOTIC STEWARDSHIP PROGRAM IN A COMMUNITY HOSPITAL

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Purpose
Antimicrobial resistance is a global issue impacting healthcare systems including Saint Margaret Mercy (SMM), a two-campus hospital located in northwest Indiana. Prior to the start of an Antibiotic Stewardship Program (ASP), there was no dedicated clinical pharmacist to review antibiotic prescribing. The purpose of this study is to evaluate the effectiveness of an ASP at a community hospital.

Methods
Phase I entailed a comprehensive baseline evaluation of current antibiotic prescribing. A retrospective chart review was conducted which targeted the top seven antibiotics utilized in SMM from December 2008 through May 2009. A total of 142 charts were reviewed. Subjects were randomly selected and inclusion criteria included patients > 18 years old, receiving treatment antibiotics for ≥ 48 hours.

Results and Conclusion
Out of 142 charts, 31 (21.8%) were found to be in compliance with SMM empiric guidelines while 96 (67.6%) were not. Only 59 (41.5%) patients were following the recommended Sanford guidelines. Of the original 142 patients, 70 (49.3%) cases did not qualify for antibiotic streamlining due to negative cultures or cultures not being drawn. Approximately 45 (31.7%) were eligible for streamlining but only 26 (57.8%) of these patients were appropriately streamlined. Analyzing baseline data indicated a need for an ASP, which was initiated in June 2009. The ASP consists of an ID pharmacist reviewing and streamlining antibiotic prescribing. Phase two of this study will focus on improving physician prescribing patterns. This will be accomplished by having an ID pharmacist review antibiotic regimen and leave recommendations for physicians. The SMM empiric guidelines were updated and distributed to each patient chart. A 6-month pilot for an automatic discontinuation of duplicate therapy will be initiated. Any changes made per hospital policy and recommendations left for physicians will be documented to identify cost savings and appropriateness of prescribing patterns.

Learning Objectives:

Explain strategies of an Antibiotic Stewardship Program

Identify the outcomes of an Antibiotic Stewardship Program

Self Assessment Questions:

Strategies utilized in an Antibiotic Stewardship Program include:

Goal outcomes of an Antibiotic Stewardship Program include except:

RE-HOSPITALIZATION RATES OF VETERANS WHO ARE TREATED WITH AZITHROMYCIN AND HAVE BOTH VARYING CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) EXACERBATION SEVERITY AND RISK FOR MULTIPLE DRUG RESISTANT ORGANISMS

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Background:
At Edward Hines, Jr. VA Hospital, a significant number of patients are treated for COPD exacerbation symptoms, and azithromycin is initiated. Although this agent is initiated both for its anti-microbial and anti-inflammatory properties, patients are not being treated according to GOLD guideline recommendations for antibiotic use in acute exacerbation COPD reduction. Upon re-hospitalization, patients are also commonly re-treated with azithromycin. Thus, proper clinical management of acute COPD exacerbations could have a significant impact on antimicrobial resistance and the overall healthcare costs of the disease.

Purpose:
The objective of this study is to compare the rate of repeat hospitalizations in veterans in Group A (mild exacerbation with no risk factors) versus those in Group B/C (moderate and severe exacerbations with risk factors) after an initial acute bacterial COPD exacerbation has been treated with azithromycin.

Methods:
This retrospective study reviews a computerized patient record system at Edward Hines, Jr. VA Hospital and includes patients from 4/1/2008 to 9/30/2009 who received at least once dose of azithromycin for an acute bacterial COPD exacerbation. Patients are stratified according to Group A, B, or C.

The primary outcome of the study is to assess the difference in the rate of readmission within 30 days in Group A patients as compared to Group B/C patients. Secondary outcomes of the study are time to re-hospitalization, a composite of re-hospitalization risk and mortality, pulmonary function tests, oxygen requirement (new versus baseline), arterial blood gas, and invasive or noninvasive mechanical ventilation.

Results/Conclusion:
Data collection is in progress. Results are to be presented at the Great Lakes Residency Conference.

Learning Objectives:

Explain the current treatment guidelines for antimicrobial use in COPD exacerbations.

Recognize if the current practice of treating COPD exacerbations of varying severity and risk for MDR organisms with azithromycin at Hines VA results in increased re-hospitalization rates.

Self Assessment Questions:

True or False: According to the GOLD guidelines, first line treatment for a Group A COPD exacerbation is azithromycin.

True or False: Antibiotics that cover more resistant organisms are recommended for Group B and C COPD exacerbations as compared with Group A.

FIXED SINGLE-DOSE RASBURICASE FOR TUMOR LYSIS SYNDROME IN ADULTS

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Purpose: Tumor Lysis Syndrome (TLS) is an oncologic emergency that can lead to a host of metabolic disturbances and ultimately lead to acute renal failure. Hyperuricemia, one of the metabolic disturbances attributed to TLS, is caused by the rapid catabolism of proteins, leading to elevated uric acid levels. Rasburicase, Elitek, is a recombinant urate-oxidase enzyme FDA approved for the treatment of TLS in pediatric patients only. In this study, we aimed to determine if a single-fixed dose of rasburicase 4.5mg in adults is effective in reducing uric acid levels. Methods: Records from June 2006 - November 2009 admitted to the John H. Stroger, Jr. Hospital of Cook County (JHS) were surveyed and 21 charts were identified to have received a single-fixed dose of rasburicase. Serum creatinine, potassium, calcium, phosphate, and lactate dehydrogenase (LDH) levels were recorded at baseline, 24 hours, and 48 hours after the single dose. Results: Subjects included 6 female, 15 male with an age range of 34 - 82 years of age, and an average age of 56 years old. The weight ranged from 52.2 - 102.1kg and an average of 76.8kg. The average serum uric acid level was 15.4mg/dL with a range of 4.6 - 27.5mg/dL. The average decrease in uric acid 24 hours and 48 hours after the first dose was 8.6mg/dL and 10.6mg/dL, respectively. No significant change was seen in terms of serum creatinine, but a decrease in potassium and phosphate levels were observed. The institution saved a significant amount of money by using the single dose approach. Conclusion: Our study validates that a single dose of rasburicase 4.5mg is effective in decreasing uric acid levels and results in a significant cost savings to the institution compared to the weight based dosing approach.

Learning Objectives:

State current recommendations on management of Tumor Lysis Syndrome (TLS)

Identify electrolyte abnormalities characteristic in patients presenting with TLS

Self Assessment Questions:

True or False: Urinary alkalization is currently recommended in the management of TLS

What are some risk factors for developing TLS?

EVALUATION OF NARCOTIC/ACETAMINOPHEN PRESCRIPTION PATTERNS AND ACETAMINOPHEN TOXICITY IN A MANAGED CARE POPULATION

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OBJECTIVE: To determine narcotic/acetaminophen prescription patterns, examine the factors associated with prescriptions written for more than 4 grams of acetaminophen per day, and check prior acetaminophen use for patients with acetaminophen overdose or liver toxicity.

METHODS: A retrospective cohort study was performed using claims from a national health plan between January 2008 and December 2009 for both Medicare and fully insured commercial members who had at least one narcotic/acetaminophen prescription. The total number and percentage of claims and unique members for each type of narcotic/acetaminophen prescription, and the total number of prescriptions containing an average daily dose of more than 4 grams per day of acetaminophen were calculated. An analysis was also done across three strata of average daily dose of acetaminophen (≤3.25g/day;3.26g-4g/day; >4g/day). Multiple logistic regression analysis was used to examine factors related to narcotic/acetaminophen prescriptions in excess of 4 grams per day of acetaminophen. Factors that were examined include member demographics and geographical location, prescriber specialty, and type and strength of the narcotic/acetaminophen prescription. Prior acetaminophen use for members with acetaminophen overdose or liver toxicity was examined.

RESULTS: Between January 2008 and December of 2009, approximately 11,500,000 narcotic/acetaminophen prescriptions were identified and 4.9% of these prescriptions were dispensed for daily supplies that could exceed 4 grams of acetaminophen. The most common prescription filled was hydrocodone/acetaminophen (60.0%). Additional analyses to meet the objectives are being performed.

CONCLUSION: Approximately 4.9% of narcotic/acetaminophen combination products are dispensed with a daily supply that exceeds 4 grams of acetaminophen. Further analysese are being conducted to assess the factors associated with high doses of acetaminophen and prior acetaminophen use for patients with acetaminophen overdose or liver toxicity.

Learning Objectives:

Describe current concerns with acetaminophen-based products, especially combination prescription products

Discuss the factors associated with narcotic/acetaminophen prescriptions written for more than 4 grams of acetaminophen per day

Self Assessment Questions:

All the following agents are used in combination with acetaminophen and require a prescription except:
a.Codeine
b.Propoxyphene
c.Phenylephrine
d.oxycodone

The FDA advisory committee's suggested lowering the recommended daily maximum dose of acetaminophen to:
a.7,500 mg
b.4,000 mg
c.3,500 mg
d.3,250 mg

THERAPEUTIC ENOXAPARIN DOSING IN PEDIATRIC PATIENTS

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Purpose: The study aimed to identify appropriate enoxaparin doses required to achieve therapeutic anti-factor Xa levels in children less than 18 years of age.
Methods: A retrospective chart review was completed of all inpatients less than 18 years of age who received treatment doses of subcutaneous enoxaparin from January 1, 2008 to September 30, 2009. Patients were excluded if they were receiving hemodialysis, or if an anti-factor Xa level was not drawn or was drawn inappropriately (less than 3 hours or exceeding 6.25 hours post dose). The primary outcome measure was the enoxaparin dose (mg per kilogram) required to achieve a therapeutic anti-factor Xa level, defined as 0.5 to 1.0 units/ml. Secondary outcome measures included the number of anti-factor Xa levels, number of dose adjustments and time required to achieve goal anti-factor Xa levels. Major and minor bleeding events were also evaluated.
Results: A total of 144 patients were evaluated for inclusion, subsequently 85 patients were included for a total of 109 dosing episodes. Preliminary results indicate that all patients less than 5 years of age required a mean initial therapeutic dose exceeding guideline recommended doses. Infants less than 2 months of age (n=8) required an initial mean dose of 1.67 mg/kg (1.23-2.04) and age groups 2-12 months (n=28), 1-2 years, (n=13) and 2-5 years (n=9) required 1.71 mg/kg (0.81-2.86), 1.23 mg/kg (0.83-1.67), and 1.49 mg/kg (0.93-2.17), respectively. Patients ages 5-12 years of age (n=19) required an initial mean dose of 1.07 mg/kg (0.76-1.46) and ages 12-18 years of age required 0.98 mg/kg (0.61-1.27) in order to achieve therapeutic anti-factor Xa levels. Final results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Define the recommended initial enoxaparin doses for infants less than 2 months of age and for infants and children greater than 2 months of age.

Identify the goal anti-factor Xa level for therapeutic enoxaparin dosing.

Self Assessment Questions:

Based on current guideline recommendations, a 3 year old male should be started on a treatment enoxaparin dose of
a.1.5 mg/kg/dose
b.1.2 mg/kg/dose
c.1 mg/kg/dose
d.0.5 mg/kg/dose

The goal anti-factor Xa for the treatment of venous thromboemobolism is
a.0.1-0.4 units/ml
b.0.3-0.6 units/ml
c.0.5-1.0 units/ml
d.0.5-1.5 units/ml

ESTABLISHING A RELIABLE METHOD FOR EVALUATING AND CORRECTING INHALER TECHNIQUE OVER THE TELEPHONE

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Background

Improper asthma inhaler technique is a common problem. It worsens asthma control and increases healthcare costs. Inhaler technique teaching methods previously studied include written, verbal, video, and hands-on instruction. The role of telephonic asthma management is evolving in patient care. It can allow for more consistent monitoring and increase healthcare access for rural patients and mail order pharmacy users. Currently there is no established method to telephonically assess and teach inhaler technique. The objective of this study is to identify a reliable and valid method for assessing and correcting inhaler technique via telephone.

Methods

This study will include thirty patients diagnosed with asthma who are 18 years of age or older, English-speaking, and currently using an albuterol metered dose inhaler (MDI) and a fluticasone/salmeterol diskus inhaler. Inhaler technique will be telephonically assessed, taught, and reassessed using two placebo inhalers (MDI and diskus). Each participant and a pharmacist will be placed in separate rooms. All pharmacist-patient interaction will occur over the telephone and be videotaped. The pharmacist will ask the participant to use the first placebo inhaler as he/she normally would. Next, the pharmacist will evaluate the participants inhaler technique, using a verbal assessment template. Then the pharmacist will teach proper inhaler technique and ask the participant to use the inhaler again. Finally, the pharmacist will reassess the participants inhaler technique. These steps are repeated with the second placebo inhaler. After the intervention, the videotapes will be evaluated to determine if each telephonic assessment of inhaler technique is correct. To determine if the telephonic teaching improved inhaler technique, pre- and post-intervention assessments will be compared. Information from this study will be used to develop a method to guide inhaler technique assessment by telephone.

Results/Conclusion

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

Learning Objectives:

Explain effective methods for teaching proper inhaler technique

Discuss the role of telephonically assessing and correcting inhaler technique

Self Assessment Questions:

(T/F) Current literature has identified the value of teaching inhaler technique over the phone

Which of the following factors contribute to retention of proper inhaler technique?

a) Provider monitoring patient technique
b) Provider demonstration
c) Patient demonstration
d) a & b
e) b & c
f) All of the above

USE OF ERYTHROPOIETIN STIMULATING AGENTS IN HOSPITALIZED PATIENTS WITH END STAGE RENAL DISEASE RECEIVING DIALYSIS.

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Purpose: This study is designed to review the effect of hospitalization on hemoglobin levels from admission to discharge in patients with end-stage renal disease receiving dialysis and erythropoietin stimulating agents (ESAs). Differences in hemoglobin changes and trends between patients receiving continuation of current outpatient ESA dose during hospitalization and patients receiving ESA doses higher than previous outpatient doses were analyzed.

Methods: This retrospective review evaluated patients with end-stage renal disease receiving dialysis and ESAs admitted to institution from January 1, 2008 to December 31, 2009. Patients with above criteria 18 years of age or older were eligible for inclusion. Excluded patients were those with surgical procedures or major bleeding events during hospitalization, and those with active malignancy. Primary objective was to assess effect of ESA dosing on hemoglobin levels from admission to discharge and to evaluate differences, if any, between hospitalized patients who were continued on equivalent ESA dosing from outpatient and those receiving an increased ESA dose. Descriptive analysis of all eligible patients is ongoing with comparative analysis for patients with recorded outpatient ESA doses stratified by doses received during hospitalization for evaluation of outcomes in each group.

Results: To date, 49 patients have been analyzed for inclusion in descriptive analysis of ESA use. Median darbepoetin dose received was 100 mcg within this group with average age of 57 years (STD +/- 14.5) and weight of 81.4 kilograms (STD +/- 17.9). Of these patients, average change in hemoglobin was -0.87 g/dL over hospitalization (range 1.1 to -3.7) from baseline hemoglobin average of 10.6 g/dL. Analysis of hemoglobin trends is ongoing at this time as is evaluation and stratification into comparative groups based upon outpatient doses.

Conclusions: No conclusions to date as data are still being evaluated.

Learning Objectives:

Describe the mechanism of action and role of erythropoietin stimulating agents in patients with end stage renal disease.

Review the current recommendations and issues regarding goals of therapy with erythropoietin stimulating agents in patients with end stage renal disease.

Self Assessment Questions:

What is the FDA approved starting dose for darbepoetin in patients with anemia associated with end stage renal disease?

What is the FDA recommended target hemoglobin goal for patients with end stage renal disease receiving erythropoietin stimulating agents?

IMPACT OF PHARMACIST DISCHARGE COUNSELING ON THIENOPYRIDINE ADHERENCE

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Purpose: Patients with a coronary artery stent have an increased risk for stent thrombosis. Premature discontinuation of thienopyridines has been associated with stent thrombosis, resulting in increased cardiovascular morbidity and mortality. Thienopyridine non-adherence has been associated with various barriers, including adverse drug effects and lack of discharge instructions. Pharmacist counseling in the outpatient setting has been shown to improve adherence rates with chronic disease state medications. The impact of pharmacist discharge counseling on rates of medication adherence has not been previously evaluated. The purpose of this study is to determine if pharmacist discharge counseling is associated with increased rates of thienopyridine adherence.

Methods: All patients who were newly started on clopidogrel between September 2009 and March 2010 and met the inclusion criteria will be enrolled in this study. The intervention patients will receive counseling from a clinical pharmacist prior to discharge. The control group will consist of patients who were newly started on clopidogrel prior to formalization of a pharmacist discharge counseling service and as a result received only standard discharge instructions. Inclusion criteria are: age greater than or equal to 18 years, active orders for clopidogrel, insurance coverage through the Health Alliance Plan, and discharged on clopidogrel with treatment continuation for greater than 1 month. Patient characteristics will be analyzed to identify potential predictors for patient non-adherence. Medication refill records will be reviewed to measure patient adherence at 1, 6, and 12 months. At 1 month, adherence rate will be expressed as percentage of patients who obtain refills within 6 days of the expected date. At 6 and 12 months, adherence will be defined as a medication possession ratio of at least 0.8. Chi Square and logistic regression analyses will be used to evaluate the data.

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

Learning Objectives:

Explain the impact of premature discontinuation of dual antiplatelet therapy on patient outcomes.

Identify barriers to adherence and discuss how pharmacist discharge counseling can help to address some of these barriers.

Self Assessment Questions:

Following premature discontinuation of dual antiplatelet therapy, stent thrombosis within 9 months has been shown to occur in what percentage of patients?
a) 10%
b) 20%
c) 30%
d) 50%
e) 80%

Based on previous studies, barriers to adherence include all of the following except:
a) Concern about health care costs
b) Lack of discharge instructions
c) Adverse effects
d) Age
e) Lack of transportation

EFFECTS OF INTRAVENOUS ACYCLOVIR PRE-AUTHORIZATION REQUIREMENT ON CHILDREN WITH HERPES SIMPLEX VIRUS INFECTIONS

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PURPOSE:
Use of intravenous acyclovir has greatly decreased mortality associated with herpes simplex encephalitis and neonatal herpes simplex infections. In February 2009 a nationwide shortage of intravenous acyclovir prompted the antimicrobial stewardship program at our institution to implement a pre-authorization requirement for acyclovir use. The objective of this study is to determine the effect of a preauthorization requirement for the use of intravenous acyclovir on the incidence of acyclovir omission in patients with proven neonatal or pediatric central nervous system or disseminated herpes simplex virus infections.
METHODS:
This is a retrospective chart review comparing intravenous acyclovir use before and after implementation of a pre-authorization requirement. Patients admitted to Riley Hospital for Children between January 1, 2007 and January 31, 2009 with positive laboratory diagnostic results for HSV will be cross-referenced with a pharmacy computer-generated list of patients receiving intravenous acyclovir during the study period to determine how many patients with HSV infection did not receive IV acyclovir. Incidence of acyclovir omission in proven HSV before and after pre-authorization requirement will be compared using a chi-squared or Fishers exact test. Mean duration of IV acyclovir courses and mean duration of stay in patients receiving IV acyclovir before and after pre-authorization requirement will be compared using independent samples t-tests. The number of IV acyclovir courses and number of IV acyclovir courses greater than 48 hours will be evaluated.

RESULTS AND CONCLUSION:
Data collection is ongoing. Results and conclusion will be presented at Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Discuss the impact of intravenous acyclovir on mortality in pediatric and neonatal patients with central nervous system or disseminated herpes simplex virus infection

State the recommendation given by the ASHP for use of intravenous acyclovir during acyclovir shortage

Self Assessment Questions:

True or False: There are multiple medications equally as safe and effective as acyclovir for the treatment of central nervous system herpes simplex infections.

For which types of neonatal HSV infections should intravenous acyclovir be used?
a. Disseminated
b.Cutaneous
c.Central nervous system
d.A and C
e.All of the above

SAFETY OF COMBINATION ALTEPLASE AND INTRA-ARTERIAL GLYCOPROTEIN IIB/IIIA INHIBITOR THERAPY FOR ACUTE ISCHEMIC STROKE

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Purpose: Stroke is the third leading cause of death and the leading cause of long term disability in the United States, though consistently safe and effective therapies for its management in a broad population have yet to be identified. The American Stroke Association guidelines for the management of acute ischemic stroke (AIS) recommend the use of intravenous alteplase (rtPA) in appropriate candidates, with intra-arterial (IA) rtPA administration an option in select patients. Additional pharmacological therapies including glycoprotein (GP) IIb/IIIa inhibitors for AIS have been evaluated. Intravenous use of GP IIb/IIIa inhibitors is associated with increased bleeding risk without benefit and is not recommended. However, IA administration of GP IIb/IIa inhibitors is utilized in select patients although limited data exists regarding its safety and efficacy in AIS. The primary objective of this study is to evaluate the safety of combination rtPA and IA GP IIb/IIIa inhibitor therapy for AIS. Rates and type of bleeding complications following therapy will be determined. Secondary objectives include description of combination therapy use and identification of clinical outcomes following combination therapy in patients presenting with AIS.

Methods: This IRB-approved retrospective study includes all adult patients treated for AIS at the Cleveland Clinic who received any combination of rtPA and IA GP IIb/IIIa inhibitor. Data to be collected includes patient demographics, size and location of the infarct, National Institute of Health Stroke Scale (at baseline, 24 and 48 hours), symptomatic intracranial hemorrhage or other bleed within 48 hours, recanalization rates as determined by Thrombolysis in Myocardial Infarction Score, thrombolytic and antiplatelet medication use, anticoagulant and antiplatelet use prior to admit, and mortality at discharge. Descriptive statistics will be used to summarize the findings of this study.

Results/Conclusions: Data collection and analysis are in progress. Results and conclusion will be presented at Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Describe the pharmacologic options recommended for the management of acute ischemic stroke.

Evaluate the use of combination therapy including IA GP IIb/IIIa inhibitors for the management of acute ischemic stroke.

Self Assessment Questions:

True/False: Intra-arterial glycoprotein IIb/IIIa inhibitors are recommended as alternative treatment for ischemic stroke when patients do not qualify for intravenous rtPA therapy.

True/False: Intravenous abciximab administered within 6 hours from symptom onset was found to be beneficial in patients with ischemic stroke.

COMPARISON OF THE MEDICATION HISTORY PROCESS AT TWO EMERGENCY DEPARTMENTS IN A MULTI-CAMPUS HEALTH CARE SYSTEM; AND IMPLEMENTATION OF A BEST PRACTICE POLICY

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Background: Medication reconciliation begins with an accurate medication history. Mercy Health Partners is a multi-campus hospital system in which the two largest campuses utilize different models to obtain medication histories. One campus utilizes pharmacy technicians to obtain medication histories on all patients who present to the emergency department, while the other campus relies on nursing staff to obtain medication histories.

Objective: Does a pharmacy technician medication history model result in a more accurate medication history than those performed by nursing?

Methods: Patient census reports were reviewed to generate a list of patients who met the study criteria. Inclusion criteria included admission through the emergency department and ability to communicate information for a medication history. Exclusion criteria included patients admitted to intensive care units, patients transferred from another hospital, or patients less than 18 years of age. A subset of patients was randomly selected to be interviewed by a single pharmacist investigator. The pharmacist reviewed the medication history recorded in the electronic medical record and compared the record with information obtained from the patient or patient representative. When discrepancies were found, the patients pharmacy and/or prescribing physician were queried for clarification. The discrepancies assessed include missing doses, missing frequencies, incorrect doses, incorrect frequencies, medications listed that the patient does not currently take, and medications the patient takes that were omitted from the record. A committee comprised of clinically-trained pharmacists met to determine the number and severity of discrepancies. The primary outcome is the difference in discrepancies between nurse- and technician-collected medication histories. The secondary outcomes assessed will include cost of staff time involved, physician satisfaction, and costs associated with potential and/or actual medication misadventures.

Results/Conclusions: Data collection and analysis are ongoing. Final results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference in April 2010.

Learning Objectives:

1.Identify advantages and disadvantages of the two methods presented for obtaining patient medication histories.

2.Describe the types and severity of medication errors that may occur when obtaining patient medication histories.

Self Assessment Questions:

True / FalseFor purposes of meeting Joint Commission standards, only the discharge medication reconciliation is required.

Which of the following are strategies that may be used to clarify the patient medication history?
A.Open-ended questioning of the patient
B.Contacting the patient Pharmacy
C.Questioning family members or care givers
D.All of the above.

ASSESSMENT OF PHYSICIANS AND ADVANCED PRACTICE PROVIDERS ATTITUDES TOWARD THE COMMUNITY PHARMACISTS ROLE IN THE MANAGEMENT OF PATIENTS WITH ASTHMA

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PURPOSE: Asthma is an undertreated and underdiagnosed disease and continues to pose a significant public health burden. Community pharmacists are well positioned to collaborate with other healthcare professionals to improve asthma management. Primary: to evaluate physicians and advanced practice providers attitudes towards the type and level of involvement community pharmacists should have in asthma management. Secondary: to compare attitudes among different practitioners; to identify practitioner characteristics that affect these attitudes; to identify perceived obstacles toward involvement of community pharmacists in therapeutic asthma drug management.

METHODS: An anonymous web-based survey will be administered via email to physicians and advanced practice providers across the state of Illinois. The introductory email will include a description of the survey and the survey URL. The survey will be available for four weeks. A reminder email will be sent to all practitioners after two and three weeks to solicit additional responses. The survey tool will collect information relating to practitioner practice setting and other characteristics, attitudes toward varying levels of community pharmacist involvement in asthma management, and perceived obstacles toward involvement of community pharmacists in therapeutic drug management of patients with asthma. Comparative and descriptive statistics will be used via SPSS software.

RESULTS: Data collection is in progress. Results will be presented at the 2010 Great Lakes Pharmacy Resident Conference.

CONCLUSIONS: Results from this survey may uncover practitioner attitudes so that community pharmacists may implement services to improve patient outcomes in a way that is amenable to the entire healthcare team. This research may reveal perceived obstacles toward involvement of community pharmacists in therapeutic asthma drug management and with knowledge of these barriers may better arm them to effectively engage in asthma management activities.

Learning Objectives:

1.Describe healthcare providers attitudes toward the community pharmacists role in therapeutic drug management.

2.Identify providers perceived obstacles toward community pharmacists involvement in therapeutic drug management of patients with asthma.

Self Assessment Questions:

1.True or False: A majority of healthcare providers believe that community pharmacists should engage in drug therapy management activities including adjusting existing therapy for inadequately-controlled asthma and sending the appropriate documentation to the healthcare provider.

2.True or False: A majority of healthcare providers perceive lack of clinical knowledge and training as a barrier toward involvement of community pharmacists in therapeutic drug management of patients with asthma.

EVALUATION OF THE MANAGEMENT OF DYSLIPIDEMIA IN PATIENTS WITH STATIN-INDUCED MYOPATHY IN AN AMBULATORY CLINIC

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Purpose

Statin-induced myopathy is a relatively common and clinically important cause of statin intolerance and discontinuation. There is little clinical data to guide the management of dyslipidemia in patients intolerant to statins. The National Lipid Association (NLA) and the American College of Cardiology (ACC)/American Heart Association (AHA)/National Heart, Lung, and Blood Institute (NHLBI) have each issued guidelines for the management of patients with statin-induced myopathy. While these guidelines share similar recommendations, they do have several differences; and evidence assessing the clinical utility of these guidelines is minimal. The primary purpose of this study is to evaluate current management strategies of Monroe Clinic physicians to determine the most effective strategies for managing dyslipidemia in these patients. Results will aim to guide future management. Secondary objectives are to determine the rate of statin-induced myopathy in Monroe Clinic patients and the rate of cardiovascular events following statin discontinuation.

Methods

Monroe clinic outpatients receiving a statin between January 1, 2006 and July 31, 2009 were identified within the institutions EPIC database. This group was further divided into patients that discontinued a statin due to side effects or allergic response. A retrospective chart review was conducted in these patients to identify those who experienced statin-induced myopathy.

Data collected included:
Demographics
Risk factors for statin-induced myopathy
Laboratory data: Fasting lipid panel, liver function tests, creatine kinase levels
Dyslipidemia management strategies
Documented cardiovascular adverse events following statin discontinuation
Framingham risk factors or risk equivalents

Patients excluded from evaluation included those with no follow-up fasting lipid panel within one year of discontinuation or no follow-up appointment with their primary care provider within one year.

The data was analyzed to determine management strategies effective in achieving LDL goal in this population.

Results/ Conclusion

Data collection and analysis are ongoing; results expected April 2010.

Learning Objectives:

Identify risk factors for developing statin-induced myopathy.

Discuss if it is appropriate to rechallenge patients with a history of statin-induced myopathy with statin therapy.

Self Assessment Questions:

Risk factor(s) for developing statin-induced myopathy include:
a.Untreated hypothyroidism
b.Advanced age
c.Concomitant Niaspan use
d.Concomitant fenofibrate use
e.All of the above

True or False: An effective strategy for achieving LDL goal in patients with statin-induced myopathy is trial with an alternative statin.

IMPACT OF A COMMUNITY PHARMACY-BASED MEDICATION THERAPY MANAGEMENT (MTM) PROGRAM ON ADHERENCE TO ANTIDIABETIC DRUG REGIMENS AND CLINICAL PRACTICE GUIDELINES

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Purpose: In 2003, the World Health Organization published "Adherence to Long-Term Therapies: Evidence for Action," which encourages healthcare providers to focus on improving medication adherence. The primary objective of this study is to determine the impact of a community pharmacy-based MTM program on patient adherence to antidiabetic drug regimens. This study will also examine the impact these MTM interventions have on the use of ACE inhibitors, statins, and aspirin in patients with diabetes.

Methods: Patients with diabetes who have a selected Medicare Part D payer, fill their prescriptions at a grocery pharmacy, and were eligible for MTM interventions between 7/1/07 and 6/30/08 will be identified through a central pharmacy database. The estimated 400 subjects will be divided into an intervention group who received MTM services and a control group who declined these services. Pharmacy refill records will be used to retrospectively assess patient adherence to antidiabetic drug regimens using medication possession ratio (MPR), which is defined as [number of medication doses provided/number of prescribed doses from first fill to exhaustion of last fill]. MPRs will be calculated for six months before, and nine months after, the first MTM intervention in the intervention group. In the control group, MPRs will be calculated for the six months before, and nine months after, the mean first intervention date in the intervention group. The study will also assess adherence after multiple MTM interventions versus a single intervention and the use of ACE inhibitors, statins, and aspirin after MTM interventions.

Results/Conclusions: This study will use SPSS and descriptive statistics for baseline data analysis and SAS to perform a generalized linear model, with adjustments for pertinent covariates, for the outcomes analyses. Data collection is on-going. Final results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Describe the impact of medication nonadherence on healthcare outcomes

List and describe the 5 categories of factors that contribute to medication nonadherence as defined by the World Health Organization

Self Assessment Questions:

1.Which of the following is/are true regarding medication nonadherence?
a.Identified as cause of failure in 30-50% of prescriptions for chronic illness
b.Responsible for a large portion of medication related hospitalizations
c.Associated with increased morbidity and mortality
d.Associated with increased healthcare costs
e.All of the above

2.Therapeutic regimen complexity and frequent regimen changes are best described as which type of factor that leads to medication nonadherence?
a.Socioeconomic
b.Healthcare team/system
c.Condition-related
d.Therapy-related
e.Patient-related

AMIODARONE FOR ATRIAL FIBRILLATION FOLLOWING CARDIOTHORACIC SURGERY: AN EVALUATION OF DOSING AND RECURRENCE

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Purpose: Postoperative atrial fibrillation (POAF) is a common complication following cardiothoracic surgery, with an incidence as high as 65%. Patients who develop POAF are at greater risk for congestive heart failure, renal insufficiency, and stroke, which can also lead to prolonged hospitalizations and greater resource usage. Amiodarone is a frequently used therapy for the treatment of POAF; however, data are limited. Literature lacks for determining the optimal dose for converting patients from a continuous infusion of amiodarone to oral administration, especially in patients with atrial fibrillation that was either resistant to initial cardioversion or that recurred after a successful cardioversion. The primary objective of this study is to evaluate the recurrence of POAF following successful medical cadioversion with amiodarone. Time to recurrence following initial conversion, dose de-escalation, and conversion from intravenous to oral amiodarone will also be evaluated.

Methods: This project will assess the current literature available on the incidence and treatment of POAF in the cardiothoracic population, as well as information specific to amiodarone dosing and pharmacokinetics. Retrospective data will be collected via chart review of all patients who received intravenous amiodarone between 7/1/08 and 6/30/09. Patients will be included if they developed atrial fibrillation post-operative day #0 thru day #7 following any intrathoracic procedure. Data collected will include procedure and any related complications, total intravenous amiodarone dose in milligrams (including bolus doses and infusion rate), oral dose following conversion from IV, and timing of the first oral dose in relation to discontinuing the IV infusion. This project will contribute to the development of treatment guidelines at Froedtert Hospital to serve as a reference to optimize pharmacotherapy and ensure a consistent approach when using amiodarone, and when transitioning patients from IV to oral dosing in the postoperative setting.

Final results will be presented at the Great Lakes Residency Conference.

Learning Objectives:

Identify the risk factors for developing postoperative atrial fibrillation in patients undergoing a cardiothoracic procedure.

Describe the treatment options for postoperative atrial fibrillation.

Self Assessment Questions:

True / false: Postoperative atrial fibrillation is associated with increased risk of congestive heart failure, renal insufficiency, and stroke.

True / false: Postoperative atrial fibrillation is associated with increased hospital readmission rates, increased intensive care unit length of stay, and overall hospital length of stay.

THE UTILITY OF AN ANTIMICROBIAL STEWARDSHIP PROGRAM IN A COMMUNITY HOSPITAL USING EXISTING RESOURCES AND STAFF

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Background:
Several articles have provided evidence stressing the importance of the appropriate use of antimicrobial agents. Hospital overuse of antimicrobial agents and subsequent antibiotic misuse can lead to the development of antibiotic resistance and contribute to the rising cost of health care. There is a dire need to establish a rational method for the use of antimicrobial agents. A multidisciplinary antimicrobial team will improve an established ICU AMSP, and implement a hospital-wide AMSP that will optimize antibiotic use while utilizing currently available resources.

Purpose:
The purpose of this analysis is to demonstrate the utility of a hospital wide AMSP using staff and resources that are currently available.

Methods:
Currently, the AMSP is implemented only in the ICU. Antimicrobial therapy monitoring includes the following: antibiotic monitoring cards indicating antibiotic regimen, infectious disease diagnosis and cost; pharmacist recommendations; Infectious Disease physician notes; tracking all culture and sensitivity results and establishing resistance patterns and assessing resistance trends. The program will be expanded to include all non-ICU acute areas.

After the program has been expanded to non-ICU acute areas, antibiotic reports will be generated for an established group of broad spectrum antibiotics. Antibiotic utilization data will be obtained. The information collected will be presented as a systematic approach that focuses on resistance, cost and inappropriate use in determining overall antibiotic utilization.

Results:
The results and final documents for this analysis will be completed by April 2010. The information will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Recognize the severity of antibiotic resistance and the importance of proper antibiotic selection and management.

Demonstrate the utility of implementing a hospital wide AMSP using currently available staff and resources.

Self Assessment Questions:

Benefits of implementing an AMSP include which of the following:
a.Optimizing patient care
b.Decreasing length of stay
c.Decreasing total antibiotic cost
d.Decreasing trends of antibiotic resistance
e.All of the above

True or false: Clinical pharmacy presence can have a positive impact in the implementation of an AMSP and on antimicrobial prescribing habits?

IMPACT OF PHARMACIST-DRIVEN NURSING EDUCATION ON MEDICATION HISTORY ACCURACY

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PURPOSE
An accurate medication history is an integral part of patient assessment on admission to the hospital. Errors in the medication history could potentiate errors in the medication reconciliation process. Since 2005, the accurate and complete reconciliation of medications across the continuum of care has been a National Patient Safety Goal of The Joint Commission. The methods used by many hospitals currently to perform medication reconciliations have been shown to be inaccurate. Pharmacists have demonstrated to be an ideal resource for obtaining medication histories due to their expertise and extensive training. Despite this, many hospitals do not utilize pharmacists for this process due to financial and staffing barriers. Current practice at Summa Health System is for nurses to obtain medication histories. The aim of this study is to identify the barriers of obtaining accurate medication histories and subsequently to test the efficacy of a pharmacist-driven educational program to overcome those modifiable barriers.

METHODS
This is a two phase prospective observational study including general-medical patients admitted by selected staff nurses. During the initial phase, patients will be randomly selected using predefined inclusion and exclusion criteria. Once selected, a pharmacist will obtain a medication history from the patient and update the medication reconciliation form. This new list will be compared to the list obtained by the admitting nurse. All discrepancies will be noted and all medication errors will be resolved. After completing the initial phase, the types of discrepancies will be tabulated and a nursing education program will be developed and presented to the selected nurses. Identical methods to the initial phase will be utilized during the final phase. The results from the initial phase will be compared with those from the final phase to measure the effect of the education session.

RESULTS
Data collection is currently in progress.

Learning Objectives:

Identify common errors that occur on admission medication histories

Discuss barriers preventing pharmacist obtained medication histories

Self Assessment Questions:

True or False: Missing medications accounted for most of the discrepancies found between nurse obtained and pharmacist obtained medication histories.

True or False: Lack of training is one of the barriers to pharmacists obtained medication histories.

EVALUATION OF METFORMIN USE IN RENAL INSUFFICIENCY

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Background

Metformin is considered one of the first treatment choices for type II diabetes. According to the current package insert, it is contraindicated in males with serum creatinine ≥ 1.5 mg/dl and females with serum creatinine ≥1.4mg/dl. Recent studies suggest that patients with eGFR between 30-60ml/min may be reasonable candidates for receiving metformin, despite the current package insert. To date, there is no data suggesting use of metformin in patients with CrCl<30 ml/min. Evaluation of prescribing trends will provide an opportunity for practice improvement and education regarding appropriate metformin monitoring in patients with renal insufficiency.

Purpose

This study will evaluate metformin prescribing patterns in patients with serum creatinine≥1.5 mg/dl in males, serum creatinine≥1.4 mg/dl in females and CrCl<60ml/min at JBVAMC

Methods

This study is a retrospective, electronic chart review of 400 patients within JBVAMC who are 18 years and older with an active prescription for metformin between two specified time periods before and after new evidence supporting use of metformin in renal insufficiency. Unique patients with an active prescription for metformin in the above specified time periods will be identified. Patients with at least one serum creatinine value ≥1.5mg/dL in males, and serum creatinine values ≥1.4mg/dL in females, and patients meeting 80% compliance criteria within the specified time frame will be included in this study. Baseline patient demographics, total daily dose of metformin, concomitant use of antidiabetic agents, adverse events, and HgA1c will be collected. The primary outcome is to evaluate the prescription trends for metformin in patients with CrCl 30-60ml/min prior to and following new data regarding metformin prescribing in renal insufficiency.

Results and Conclusions

This study is currently in the data collection phase. Final results with conclusions will be presented at the Great Lakes Pharmacy Conference.

Learning Objectives:

Discuss the new evidence regarding metformin prescribing in renal insufficiency

Outline risk factors that may predispose patients to lactic acidosis

Self Assessment Questions:

True or False. Metformin is a hepatically eliminated drug

Based on the current package insert, metformin is contraindicated in MALES with renal insufficiency if which of the following criteria are met?

A.CrCl<30mL/min
B.Scr≥1.5mg/dL
C.CrCl<60ml/min
D.Scr >2mg/dL

EVALUATION OF ACID SUPPRESSION MEDICATION USE AT THE LOUIS STOKES VA MEDICAL CENTER (LSVAMC)

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Purpose: Acid suppression medications (ASM), including proton-pump inhibitors (PPIs) and histamine-2 receptors blockers, are used for a variety of gastrointestinal disorders. About one-third of LSVAMC outpatients have active PPIs prescriptions. A 2007 LSVAMC medication use evaluation found that 42% of inpatients on PPIs did not have a documented indication of use. In spring 2009, a literature release and statement by the Food and Drug Administration (FDA) identified awareness of a possible drug interaction between omeprazole and clopidogrel. Due to the above information, the Pharmacy and Therapeutics Committee exhibited interest in a PPIs quick-order set. The study compares the use of omeprazole and ASM before and after implementation of a quick-order set.

Methods: A retrospective chart review evaluated ASM use in inpatients admitted to general medicine floors, the progressive care unit, and medical and cardiac intensive care units during three phases: phase 1-October 2008 (baseline prescribing habits), phase 2-May 2009 (prescribing habits following FDA statement and literature release), phase 3-February 2010 (after quick-order implementation). At least 100 patients were enrolled chronologically in each phase following a percentage distribution based on past admission rates. Information on patient demographics, diagnoses, ASM use, concurrent medication use, lab values, and comorbidities was collected using the LSVAMC medical record system. The primary endpoint compared the percent of inpatients on omeprazole between phase 1 and phase 3. Secondary endpoints compared overall usage of ASM, rates of gastrointestinal bleed during hospitalization and up to 3 months post discharge, percent of patients prescribed both omeprazole and clopidogrel, percent of patients initiated on ASM during hospitalization, and the number of discharge ASM prescriptions between all three phases. A t-test was used to evaluate continuous data. A chi-square test was used to evaluate categorical data.

Results/Concluions: Data collection is in progress. Results and conclusions will be presentated at the conference.

Learning Objectives:

Review the indications for stress ulcer prophylaxis in inpatients.

Discuss strategies for decreasing the inappropriate prescribing of acid suppression medication in patients transitioning from an inpatient to an outpatient setting.

Self Assessment Questions:

T or F - Stress ulcer prophylaxis should be given to all inpatients.

T or F - This study is a retrospective chart review that evaluates three cohorts of patients.

THE RELATIONSHIP BETWEEN GENDER AND MORTALITY IN KENTUCKY MEDICAID HEART FAILURE PATIENTS

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Purpose: Gender disparities are evident in the management of acute coronary syndromes as well associated adverse clinical outcomes; however, no such data exists regarding heart failure (HF). The objective of this study is to determine if there is a gender based difference in mortality between men and women with systolic HF.

Methods: This is a retrospective, cohort study using the Kentucky Cabinet for Health and Family Services Medicaid database. All patients with systolic HF diagnosed between January 1, 2000 and December 31, 2007 were included. ICD-9, CPT codes and medication dispensing records were examined. The primary endpoint was mortality. Secondary endpoints include hospitalization and differences in prescribing of evidence based medication for the management of systolic HF.

Preliminary Results: A total of 40,593 patients have been examined. Among the 808 individuals that died during the study period, 506 were women ($p<0.197$). Women tended to be older at time of diagnosis (66.1 versus 61.0 years, $p<0.001$) and were more likely to have comorbid stroke, diabetes, atrial fibrillation, hyperlipidemia, depression, hyperthyroidism.

Conclusions: Data analysis is still in progress. While there is a trend toward increased mortality among women with HF, this is not statistically significant. Further data analysis will include multivariate adjustment for age and other potential cofounders. Subsequently, if a difference is evident, results may be used to explore outcomes differences in non-Medicaid patient population to increase study generalizablity. Medication dispensing and hospitalization records are still pending evaluation. Ultimately this data could guide education endeavors leading to improved health outcomes and decreased healthcare costs for the treatment of women with systolic HF. Since the majority of records have already been analyzed, it is feasible that this project will be completed by date of presentation.

Learning Objectives:

Discuss gender-based differences in mortality in Kentucky Medicaid HF patients.

Describe possible differences in the use of evidence based medicine.

Self Assessment Questions:

1.Evidence based treatment proven to decrease mortality in HF includes all of the following EXCEPT:
a.Beta blockers
b.Angiotensin converting enzyme inhibitors
c.Nitrate / Hydralazine combination
d.Loop diuretics

2.Name two etiologies of HF that are more common in women than men.

EVALUATION OF COMMUNITY PHARMACY PATIENTS UTILIZATION OF THE INTERNET FOR DRUG INFORMATION

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Purpose:
While much research has been performed on the use of the Internet by patients for general health information, no known research has analyzed patients utilization of the Internet specifically for drug information, including side effects, drug interactions, dosages, and over-the-counter remedies. Additionally, little is documented regarding the implications of this utilization on the patient/pharmacist relationship. This study seeks to determine the frequency and extent of Internet use for drug information by community pharmacy patients, assess if patients use of the Internet has influenced their likelihood to contact a pharmacist for advice or drug information, and identify the types of web-based drug information tools patients would find valuable.

Methods:
45 chain community pharmacists from 15 states nationwide were identified to assist in randomly distributing a survey to 20 patients waiting for prescriptions. The survey consisted of 14 questions focusing on the frequency of Internet use among patients for drug information, how this web content affects patient behavior and interactions with a pharmacist, and the patients interest in utilizing specific web-based health and drug information tools. Interest in tools such as online video consultations with a pharmacist, email a pharmacist, weekly e-newsletters, and medication reminder emails were assessed.

Results:
Data collection is in progress. Results will be reported at the Great Lakes Pharmacy Residency Conference.

Conclusion:
Understanding how and why patients use the Internet for drug information can be valuable for pharmacists. As the number of patients seeking health resources online increases, pharmacists will be called upon not only to address the quality of the information, but also to educate patients on credible drug information websites and health portals. Furthermore, pharmacists are in a unique position to develop high quality interactive web content and tools to help patients better manage and understand their medications, ultimately improving health outcomes.

Learning Objectives:

Describe the advantages and disadvantages of patients using the Internet for drug information.

Discuss how patients utilization of the Internet may affect the patient/pharmacist relationship.

Self Assessment Questions:

According to recent studies, how many people regularly seek health information online?
a.30 million
b.50 million
c.70 million
d.90 million

True or False: The Healthy People 2010 Project has recognized the quality of Internet health information sources as a major public health issue.

EVALUATION OF INTRAVENOUS AMIODARONE, DILTIAZEM, AND METOPROLOL FOR VENTRICULAR RATE CONTROL IN CRITICALLY ILL PATIENTS WITH NEW ONSET ATRIAL FIBRILLATION WITH RAPID VENTRICULAR RATE

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Purpose:
Atrial fibrillation (AF) accounts for significant morbidity and nearly one-third of all arrhythmia-related hospitalizations. Current guidelines focus on chronic AF management with anti-arrhythmic and anticoagulant agents. However, little guidance exists for management of new onset AF with concomitant organ failure. Early AF management has been shown to have a higher success rate of restoring sinus rhythm, minimizing the risk of organ failure, and preventing thromboembolism. Consequently, recommendations for management of acute AF with concomitant organ dysfunction would be beneficial to clinicians. The purpose of this study was to compare the efficacy of intravenous (IV) amiodarone, diltiazem, or metoprolol in hemodynamically unstable patients with new onset AF and rapid ventricular rate (RVR).

Methods:
This retrospective cohort study evaluated hemodynamically unstable patients with new onset AF (onset < 48 hours) with RVR (heart rate, HR > 120 beats per minute, bpm) who were treated with IV amiodarone, diltiazem, or metoprolol. Hemodynamic instability was defined as a need for vasoactive therapy, systolic blood pressure < 90 mmHg or > 160 mmHg, mean arterial pressure < 60 mmHg, and/or HR < 60 bpm. The primary efficacy endpoint was control of ventricular rate (VR) to < 100 bpm within the first 24 hours from the initiation of treatment. Secondary efficacy and safety endpoints included relative HR reduction, number of electrical cardioversions, time to VR control, length of ICU stay, survival until ICU discharge, and incidence of bradycardia, hypotension, heart failure exacerbation, or Torsades de pointes. The sample size estimate of 75 patients per group was based on estimation VR control of 90% with diltiazem and 70% with amiodarone and metoprolol with an 80% power and a priori alpha = 0.05. Patient groups were statistically evaluated using analysis of variance, Kaplan-Meier curve, and Cox regression models.

Results & Conclusion: To be presented.

Learning Objectives:

Assess the efficacy of IV amiodarone, diltiazem, and metoprolol for controlling VR within the first 24 hours from the initiation of treatment in hemodynamically unstable patients with new onset AF with RVR

Evaluate the impact and safety of rate control agents on AF-related variables

Self Assessment Questions:

True or False: There is a standard of care for the treatment of new onset AF in the critically ill population.

True or False: Early management of acute AF has been shown to have a higher success rate of restoring sinus rhythm and minimizing the risk of organ failure and preventing thromboembolism.

DE-ESCALATION OF ANTIMICROBIAL THERAPY IN A CRITICAL CARE AREA

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Purpose: De-escalation of antimicrobial therapy consists of narrowing the spectrum by changing a broad spectrum agent to a narrow spectrum agent, eliminating a drug from combination therapy, and/or utilizing the shortest adequate duration. Modifications in therapy should ideally occur as soon as possible with the availability of culture and susceptibility results. Previous studies that have addressed de-escalation focus on patients with ventilator-associated pneumonia (VAP) but few have assessed effects on mortality. The primary objective of this study is to identify the association of de-escalation therapy and mortality at 30 days or hospital discharge. Secondary outcomes are the assessment of the incidence of de-escalation, appropriate initial therapy, recurrence of infection, resolution of infection, and days in intensive care units.

Methods: This IRB approved, prospective observational study assessed antimicrobial therapy in patients with single-site infections of the blood, urinary tract, lungs, or a wound. Patients are identified by positive microbiological results with clinician diagnosed infections of the pre-specified sites. Patients are included if they are identified by microbiological and clinical diagnosis, 18-90 years old, and have antimicrobials initiated in a critical care area. Patients are excluded if they have an unclear diagnosis, multiple site infections, age < 18 years, pregnant women, and if they are comfort care only, palliative care, or Hospice patients. Data collection includes demographical information, outpatient history of antibiotics and location of residence, comorbidities and evaluation of clinical status, culture and susceptibility results, inpatient antibiotic therapy, and course of therapy.

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

Learning Objectives:

Describe the advantages and disadvantages of antibiotic de-escalation in a critical care area.

Review the data from prior clinical trials of antibiotic de-escalation.

Self Assessment Questions:

Define de-escalation of antimicrobial therapy
a.Changing from a broad spectrum agent to a narrow spectrum agent
b.Eliminating a drug from combination therapy
c.Utilizing the shortest adequate duration
d.All of the above

True/False: Previous trials have shown that de-escalation increases mortality.

EVALUATING THE IMPACT OF COMPUTERIZED PRESCRIBER ORDER ENTRY ON MEDICATION SAFETY IN AN EMERGENCY CENTER.

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Purpose

Current literature has demonstrated a reduction in medication errors with the implementation of computerized prescriber order entry (CPOE). Other studies have shown that emergency centers (EC) remain at risk for medication errors due to the fast-paced environment and high patient volumes. The primary objective of this study was to evaluate the impact of CPOE on medication safety in the EC at our institution.

Methods

For this investigation, we evaluated how CPOE affected medication safety, medication turnaround time and adherence to The Joint Commission (TJC) medication management (MM) standards in the EC. Patients seen in the EC starting on October 14, 2009, two weeks prior to the CPOE go-live, were included in the pre-CPOE group. Patients seen in the EC starting on November 11, 2009, two weeks after the CPOE go-live, were included in the post-CPOE group. Medication orders from 200 consecutive patient profiles were retrospectively reviewed for both groups. Medication safety was assessed by reviewing medication orders for significant errors related to prescribing, transcribing, dispensing and administration. Errors that were included were inappropriate pediatric dosing, interactions with patient allergies, incomplete medication orders, administration of wrong drug, adherence to institutional guidelines and overridden flags or warnings. Medication turnaround time was evaluated by comparing the time difference from when medications were ordered to when they were administered. Current EC medication use practices were compared to multiple TJC MM standards and reviewed for adherence to Elements of Performance (EP) regarding verbal orders, "do not use abbreviations" and prospective pharmacy order review. A retrospective chart review was performed to gather data on individual patients. This data was then compiled into a spreadsheet to evaluate trends with CPOE in the EC.

Results/Conclusion

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

Learning Objectives:

Describe current benefits of CPOE and how it improves medication and patient safety in an emergency department.

Identify unresolved challenges that remain after the introduction of CPOE in an emergency department and strategies to ensure safe medication use.

Self Assessment Questions:

Which of the following is true regarding CPOE?
A. The number of patients receiving a wrong drug is decreased with CPOE
B. Average medication turnaround time is improved with CPOE
C. Verbal orders and unapproved abbreviations are decreased with CPOE
D. A and B
E. B and C

True or False: Pharmacists roles for medication management and safety are eliminated with the implementation of CPOE.

ACCURACY OF PREDICTING VANCOMYCIN PHARMACOKINETIC PARAMETERS IN OBESE PATIENTS

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Background: Vancomycin remains the most commonly prescribed antimicrobial agent for the treatment of methicillin-resistant Staphyloccoccus aureus infections. Empiric vancomycin dosing is calculated using population-based pharmacokinetic equations, incorporating patient height and weight. Limited literature is available in obese patients with body mass index (BMI) > 30 kg/m2, to determine whether total body weight (TBW) or adjusted body weight (AdBW) should be used to estimate initial vancomycin pharmacokinetic parameters. This knowledge would improve the empiric dosing of vancomycin to better achieve desired therapeutic serum concentrations, potentially optimizing efficacy and minimizing toxicity. The purpose of this study is to determine if TBW or AdBW when used in empiric pharmacokinetic equations best correlates with actual patient-specific pharmacokinetic parameters.

Methods: This is a prospective study of patients with BMI ≥ 30 kg/m2 who are prescribed vancomycin. Patients will be screened for exclusion criteria. For patients who meet inclusion criteria, the following data will be collected: patient demographics, vancomycin dosage, administration time, and duration of infusion. Peak and trough vancomycin levels will be obtained after the initial loading dose, at 30-120 minutes post the end of infusion and within 120 minutes prior to second infusion, respectively. Vancomycin levels will be processed using Fluorescence Polarization Immunoassay (AxSYM, Abbott). These levels will then be used to calculate patient-specific pharmacokinetic parameters (elimination rate constant, volume of distribution, half-life, and clearance) using a one-compartmental model. Empiric pharmacokinetic parameters obtained using TBW and AdBW will be compared with patient specific pharmacokinetic parameters to determine which weight provides better correlation.

Results/Conclusions:
Results and conclusions will be presented at the 2010 Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Identify the impact of obesity on drug disposition.

Discuss the influence of weight on empiric vancomycin dosing and on current vancomycin guideline recommendations.

Self Assessment Questions:

T/F Increase in adipose tissue leads to alteration in drug disposition.

T/F Current vancomycin guidelines recommend using adjusted body weight to calculate empiric dosing in obese patients, then adjust dosage based on serum vancomycin concentrations to achieve therapeutic levels.

USE OF PROPHYLACTIC ANTIBIOTICS FOR EXTRAVENTRICULAR DRAINS IN NEUROSURGERY PATIENTS

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PURPOSE: Extraventricular drains (EVD) are essential in the treatment of patients with neurological injuries. The use of prolonged antibiotic prophylaxis is not recommended by recent guidelines, however their use remains high. This study determined the impact of prolonged courses of antibiotic prophylaxis on the incidence of ventriculitis and antimicrobial resistance.
METHODS: Consecutive adult patients that required insertion of an EVD were identified retrospectively via an institutional database. Patients with an admitting diagnosis of brain abscess or meningitis were excluded. Patients were stratified into two groups: those receiving short course antibiotic prophylaxis (≤24 hours) and those receiving prolonged prophylaxis (>24 hours). The primary outcome was to (1.) compare the incidence of ventriculitis and (2.) compare the incidence of resistant secondary infections between the short and prolonged prophylaxis groups, respectively.
PRELIMINARY RESULTS: Data from 37 patients were collected (short: n=22; prolonged: n=15). The most common admitting diagnosis was subarachnoid hemorrhage (38%). Demographics were similar between groups. The median duration of antibiotic prophylaxis in the short group was 1 (1-1) day and 4 (2-11) days in the prolonged group ($p<0.001$). The incidence of ventriculitis in the short group was 14% and 13% in the prolonged group ($p=1.00$). The incidence of secondary infections in the short group was 28% compared to 47% in the prolonged group ($p=0.225$). Of the secondary infections, 17% in the short group and 14% in the prolonged group were resistant ($p=1.00$). The resistant infection in the short group was K pneumoniae. The resistant infection in the prolonged group was MRSA. There was no difference between groups in the development of resistant ventriculitis ($p=0.405$).
CONCLUSION: Although resistant secondary infections are not increased, patients with EVDs should not receive prolonged antibiotic prophylaxis since there is no benefit in reducing ventriculitis.

Learning Objectives:

Describe the role of extraventricular drain catheters in the treatment of patients with neurological injuries.

Identify the potential risks and benefits for prophylactic antibiotics for extraventricular drain catheters.

Self Assessment Questions:

Extraventricular drain catheters are used for:
a. monitoring intracranial pressure
b. controlling intracranial pressure
c. draining cerebrospinal fluid
d. all of the above

There are clear guidelines for antibiotic prophylaxis in patients with extraventricular drain catheters? TRUE/FALSE

IMPLEMENTATION OF GUIDELINES RESTRICTING VANCOMYCIN USE IN PATIENTS WITH SEVERE HEALTH CARE ASSOCIATED PNEUMONIA IN THE CRITICAL CARE UNIT

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PURPOSE: Inappropriate use of antimicrobials is a contributing factor to rising health care costs. Over the years, studies have shown that up to 50% of antibiotic therapy prescribed is unnecessary, leading to the evolution of resistant organisms. In order to decrease the rate of antibiotic-resistance, rising health care costs, and inappropriate prescribing, many institutions have developed antimicrobial stewardship programs (ASPs). One method used by ASPs to decease the unnecessary use of antibiotics is to develop guidelines for the appropriate initiation and continuation of antibiotic therapy. The purpose of this study is to determine the impact generated by implementing an ASP on the use of vancomycin for pneumonia patients in the critical care unit (CCU) at Luther Hospital.

METHODS: Guidelines for the appropriate use of vancomycin for the indication of pneumonia was developed and reviewed with the pulmonologists and pharmacists. A retrospective review of patients previously started on vancomycin for pneumonia in the CCU was performed. Data collected included risk factors for multi-drug resistant pathogens, lab values, chest x-ray results, treatment duration, total amount of drug used, cultures and sensitivities, and total length of stay. After baseline data was collected, a three-month trial was started in the CCU. All patients diagnosed with pneumonia and started on vancomycin were evaluated upon initiation and also at 72 hours to determine appropriateness of therapy. Recommendations to discontinue or change therapy based on patients clinical state was discussed with the prescriber. Data was collected in the same fashion as the preliminary data along with the number of recommendations the pharmacists made and the rate of acceptance by the providers. The retrospective data will be compared to the final data to assess the efficacy and impact of the ASP.

RESULTS/CONCLUSIONS: Results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference

Learning Objectives:

Discuss the potential benefits of an antimicrobial stewardship program

Explain the steps that must be taken to implement a successful antimicrobial stewardship program.

Self Assessment Questions:

List three benefits of an antimicrobial stewardship program

Describe three strategies employed by healthcare facilities to manage appropriate utilization of antibiotics.

ECOMONIC ANALYSIS OF ALVIMOPAN USE AT A COMMUNITY HOSPITAL

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PURPOSE: This study will evaluate the economic effects associated with alvimopan use at a community hospital. The use of alvimopan has been shown clinically effective in preventing postoperative ileus (POI), speeding gastrointestinal (GI) recovery, and decreasing length of stay in the hospital. The objective of this study is to assess if the clinical benefits of alvimopan translate into decreased resource utilization and costs for a community-based institution.

METHODS: This study is a retrospective and prospective chart review. All inpatients at Parkview Hospital who are at least 18 years old, received at least one dose of alvimopan or underwent large or small bowel resection surgery with primary anastomosis are eligible for the study.

Each alvimopan treated patient will be matched to a non-alvimopan treated patient control. The collected data will include basic demographic information as well as diagnosis. Surgery characteristics will also be collected to include primary reason for surgery, surgery type, and surgery duration. Length of stay will be evaluated by documenting both time to written discharge order and time to actual discharge from the hospital. The number of alvimopan doses, both preoperatively and postoperatively, will be collected to help assess the appropriateness of alvimopan use for the patient. Progression to GI recovery will be documented by collecting time to NG tube removal, time to liquid diet initiation, time to ambulation, time to first solid food, time to first flatus, and time to first bowel movement. Postoperative treatment regimen information will be collected including pain medication regimen and any other treatments utilized to help prevent/treat POI. A cost assessment will be made based on documented cost of care, billed cost to the patient, and reimbursement received. Finally, a follow-up assessment will be made by capturing 30-day readmission rates.

RESULTS/CONCLUSION: Data is still being collected. Results and conclusion will be presented at the conference.

Learning Objectives:

Describe the clinical and economic burden that results from postoperative ileus.

Recognize the clinical and economic benefits of alvimopan use in a community-based institution.

Self Assessment Questions:

True or False: The etiology of POI is multifactoral and may include the surgical trauma associated with physical manipulation of the bowel, decreased electrical activity in the GI tract due to anesthesia, local inflammation, or hyperactivity of the sympathetic nervous system.

Which of the following may be a clinical consequence of POI?
a. Pain
b. Abdominal distention
c. Pneumonia
d. All of the above

HEART FAILURE EXACERBATION CAUSED BY SEROTONIN-NOREPINEPHRINE REUPTAKE INHIBITORS

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Background:
Depression is prevalent in patients with heart failure (HF) and is associated with a poor prognosis and increased mortality. Many agents are available for the treatment of depression. Two commonly used classes are the serotonin-norepinephrine reuptake inhibitors (SNRIs) and the selective serotonin reuptake inhibitors (SSRIs). To date, there are no randomized controlled trials proving the safety and/or efficacy of SNRIs in HF patients; however, the literature contains several case reports demonstrating exacerbation or development of HF after SNRI initiation. SNRIs are thought to exacerbate HF by increasing norepinephrine concentrations, thus activating the sympathetic nervous system.

Purpose:
The purpose of this study is to assess if a relationship exists between SNRI use and HF exacerbation.

Methods:
This study is a retrospective, electronic chart review of patients with an ICD-9 diagnosis of HF at Jesse Brown VA Medical Center and a prescription for a SNRI (venlafaxine or duloxetine) at any time between October 1, 2006 and September 15, 2009. A second set of patients with an ICD-9 diagnosis of HF and a prescription for citalopram for the same time frame serves as the control group. There are no set exclusion criteria. All indications for venlafaxine and duloxetine are included. Data collection includes baseline and post-treatment blood pressure and ejection fraction, comorbidities, social history, and concomitant medications at time of exacerbation. The primary endpoint is the incidence of HF exacerbation in patients receiving a SNRI versus patients receiving citalopram. Secondary endpoints are to establish a correlation between the initiation of a SNRI and time to HF exacerbation, and to determine if a difference exists in severity (either outpatient treatment or requiring hospitalization) of HF exacerbation between the SNRI and citalopram groups.

Results:
This study is currently in the data collection phase. Results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Recognize modifiable risk factors that may cause heart failure exacerbation.

Describe the proposed mechanism by which SNRIs exacerbate heart failure.

Self Assessment Questions:

True or False: Guidelines exist for the treatment of depression in patients with heart failure.

Which of the following medications may potentiate heart failure?
a)Naproxen
b)Acetaminophen
c)Rosiglitazone
d)All of the above
e)A and C

ASSESSING CLINICAL OUTCOMES OF EXTENDED INFUSION PIPERACILLIN/TAZOBACTAM AND CEFEPIME IN CRITICALLY ILL PATIENTS

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Purpose:
The frequency of infections caused by multi-drug resistant bacteria is increasing significantly in the critically ill and poses a great challenge to the practitioner when selecting empiric antibiotics. Currently, there are very few novel compounds that are being developed for treatment of multi-drug resistant gram-negative bacteria. The combination of increasing resistance and few promising agents on the horizon means that optimization of current antibiotics is even more crucial. Based on pharmacokinetic principles, investigators have studied alternative dosing strategies for beta-lactam antibiotics, such as prolonged or extended infusions, to evaluate the impact on microbiological and economic outcomes. Very few studies have assessed clinical endpoints and of those, none have compared multiple beta-lactam antibiotics. The purpose of this study is to evaluate the application of extended infusion cefepime and piperacillin/tazobactam in critically ill patients and determine if there is a difference in clinical outcomes compared to standard infusion.

Methods:
Retrospective cohort study including all critically ill patients who received cefepime or piperacillin/tazobactam for a suspected infection in the adult critical care units at Methodist Hospital. Patients were excluded for the following reasons: less than 18 years old, on hemodialysis or with an estimated creatinine clearance less than 40 mL/min, received less than 48 hours of drug, or an absolute neutrophil count < 1000 cells/mm3. Patients were matched based on APACHE II scores. The primary outcome is ICU length of stay from start of antibiotic initiation. Secondary outcomes include all-cause mortality, total ICU length of stay, and total hospital length of stay.

Learning Objectives:

Review the pharmacokinetics and pharmacodynamics of beta-lactam antibiotics.

Describe the rationale of prolonged infusions of beta-lactams in patients with bacterial infections.

Self Assessment Questions:

Maximum bactericidal effects of cephalosporins occur when the free drug concentration exceeds the MIC for _____ of the dosing interval.
a.30%
b.45%
c.50%
d.60%

Prolonged infusions of beta-lactams achieve therapeutic use by decreasing the amount of time serum drug concentrations are maintained above the organisms MIC. T or F

EVALUATION OF ANTIBIOTIC USE IN A VETERANS ADMINISTRATION COMMUNITY LIVING CENTER

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Purpose: Impaired cognition, immunosuppression, use of invasive devices and the residential nature of nursing homes put elderly residents at high risk of contracting infections. Use of antibiotics increases the risk of patients developing Clostridium difficile infection (CDI), which has become increasingly common in recent years. Other risks of inappropriate antibiotic use include antibiotic resistance, drug-induced adverse reactions, drug interactions, and increased costs. Observational data at the Louis Stokes Cleveland VA Medical Center Community Living Center suggests that patients may be receiving unnecessary or inappropriate antibiotics prior to becoming infected with Clostridium difficile and antimicrobial resistant pathogens. The objective of this study is to determine the frequency of, reasons for, and adverse effects of inappropriate antibiotic treatment in the Community Living Center.

Methods: This is a retrospective chart review of Community Living Center patients prescribed antibiotics during a 6-month period. Patients included in this study will first have their antibiotic regimens classified as necessary or unnecessary. If antibiotics are deemed necessary, further evaluation of all components of the regimen will be conducted. Examples of unnecessary components of an antibiotic regimen include treatment of noninfectious syndromes, treatment of colonizing microorganisms, longer than necessary duration of therapy, therapeutic duplication, antimicrobial coverage that is not indicated, and untimely adjustments to antibiotic regimens following culture results. The need for a prescribed antibiotic will be determined by diagnostic and treatment guidelines from the Infectious Disease Society of America when available. If guidelines are not available, recommendations from textbooks, published articles and infectious disease physicians will be considered. Outcomes to be assessed include development of Clostridium difficile infection, whether clinical cultures yield resistant organisms, 30-day hospital admission rate and mortality. Data from this study will be used to provide baseline information for an antimicrobial stewardship program.

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

Learning Objectives:

Identify risks of inappropriate antibiotic use in the long-term care setting.

Recognize common causes of unnecessary antibiotic prescribing in a long-term care facility.

Self Assessment Questions:

Risks of inappropriate antibiotic use in the long-term care setting include:
a.Drug interactions
b.ATB resistance
c.Clostridium difficile infection
d.Increased costs
e.All of the above

True or False: The number of Americans requiring long-term care is expected to double between 2000 and 2050.

A RETROSPECTIVE EVALUATION OF MIGRAINE TREATMENT IN AN EMERGENCY DEPARTMENT LOCATED IN A COMMUNITY HOSPITAL.

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Purpose: This study evaluated the appropriateness of migraine treatment in an community hospital emergency department based on American Academy of Neurology Practice Guidelines.
Methods: Following Institutional Review Board approval, hospital records were screened for ICD-9-R code 346.0 (Migraine) over a 12 month period (January 2009 through December 2009). Inclusion criteria for the retrospective chart review were an ICD-9-R code of 346.0 as a primary or secondary diagnosis, patient age greater than 18, and release from the ED without hospital admission. Three hundred and four patients met inclusion criteria and were subsequently reviewed for general demographics, medication orders while in the ED, and discharge prescriptions.
Results: Data collection has just concluded. Statistical analysis will be completed prior to April 2010. Final results with conclusion will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Identify appropriate and inappropriate pharmacologic treatment options for acute migraine presentation to the emergency department.

Recognize and describe the potential problems that can be caused by inappropriate treatment options being utilized to treat acute migraine cases in the emergency department.

Self Assessment Questions:

Which of the following would not be a viable treatment option for a patient that has an acute migraine in the emergency department?
a) sumatriptan
b) Fiorinal
c) chlorpromazine
d) topiramate
e) metoclopramide

Antiemetics are viable treatment options for patients that present to the emergency department with an acute migraine. True or False

DRUG THERAPY PROBLEMS IN COMMUNITY BASED RESIDENTIAL FACILITIES: ASSESSING EFFECTIVENESS OF AN EDUCATIONAL INTERVENTION

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Purpose:
To assess pharmacist knowledge acquisition and application following a training session to identify and resolve drug therapy problems (DTPs) found in community based residential facilities (CBRFs, i.e. assisted living facilities).

Methods:
This project will be conducted in three phases: identification of 50 CBRF patients with DTPs that will serve as real-world examples for the training program, implementation of the training program, and evaluation to determine to what extent pharmacists may apply skills to resolve DTPs. First, of approximately 1900 total beds served, the resident via a review of the QS/1 pharmacy medication profiles will identify a convenience sample of 50 patients with potential DTPs. Potential DTPs will be categorized using criteria defined in Strand et al., 1990. Second, the resident will develop an active learning educational presentation. The DTPs that were identified will be used as patient cases so that the education session will have more credibility as real-world scenarios. Pharmacists will be guided to review the cases and how to identify DTPs
and correct them. Tools (e.g. fax templates) that may be used to communicate with the physician when a DTP is encountered will be provided. Approximately ten pharmacists who work with CBRFs will attend this two hour session and complete a test prior to and after the educational
session, to assess whether they are better able to identify DTPs following the training. Third, the resident will conduct profile reviews of the same 50 patients two and four months after the educational session to determine the number of DTPs resolved. Results will provide descriptive statistics on the extent that pharmacists improve the ability to identify and resolve DTPs that they encounter during the normal dispensing process. This pilot project will determine if expanding this intervention may improve quality of medication use among CBRF patients.

Results/Conclusion:
Currently in progress.

Learning Objectives:

Compare and contrast CBRF and skilled nursing facility (SNF) regulations.

Recognize the importance of in-depth medication profile reviews for CBRF patients.

Self Assessment Questions:

Which of the following listed below is NOT a reason why pharmacists should do more in-depth medication profile reviews of CBRF patients?

A) CBRFs are subject to less regulation than SNFs
B) CBRF patients have fewer medical conditions than SNF patients
c) CBRF patients have complicated medication regimens

True/False: SNFs are more highly regulated by the government than CBRFs.

EVALUATION OF THE IMPACT OF INPATIENT ANTICOAGULATION TEACHING PRACTICES ON PATIENT KNOWLEDGE AND READMISSION RATES

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Purpose: Patient education on warfarin therapy is critical to patient safety and successful therapy management. However, the true effect on outcomes is related to the efficacy of the education. The objectives of this study are to evaluate the impact of inpatient anticoagulation education on patient knowledge of warfarin and readmission rates for patients discharged home on warfarin.

Methods: A retrospective chart review established baseline 30- and 60-day readmission rates for patients discharged home on warfarin without education. Subsequently, a prospective study will identify patients discharged home on a warfarin from a large academic institution who have received standardized pharmacy anticoagulation education. Patients will be administered a ten question verbal warfarin knowledge assessment at baseline and by phone at 30-45 days after the initial assessment. Patient demographics, data on warfarin management, and 30- and 60-day readmission rates will also be collected. Overall knowledge assessment scores at baseline and at 30-45 days after discharge will be compared. Readmission rates of educated patients at 30 and 60 days will be compared to baseline readmission rates of patients who did not receive anticoagulation education.

Results: Fifty patients (mean age: 62 years, 62% female, 82% black) discharged home on warfarin without education had 30- and 60-day readmission rates of 32% and 54%, respectively. Of these readmissions at 30- and 60-day, 8% and 16% were related to anticoagulation therapy (INR above goal, INR below goal with presence of venous thromboembolism, gastrointestinal bleed) respectively. Preliminary prospective data (10 patients, mean age 58.2 years, 70% female, 70% black) indicate average patient knowledge score of 83% at discharge following education. Data collection is ongoing to assess knowledge assessment scores and readmission rates.

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

Learning Objectives:

Describe the components of patient education regarding anticoagulant therapy as mandated by National Patient Safety Goal (NPSG) 03.05.01.

Discuss the potential impact of effective anticoagulation patient education on patient outcomes.

Self Assessment Questions:

Patient education on anticoagulation should include discussion on which of the following:
a. The importance of follow-up monitoring
b. Compliance
c. Drug-food interactions
d. The potential for adverse drug reactions and interactions
e.All of the above

T/F Previous studies have shown that patient warfarin knowledge has been positively correlated with anticoagulation control.

COST ANALYSIS OF ENOXAPARIN TREATMENT DOSING PRE AND POST IMPLEMENTATION OF A COMPUTERIZED PHYSICIAN ORDER ENTRY ENOXAPARIN ORDER SET

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Purpose: The clinical equivalence of once daily dosing of enoxaparin (1.5 mg/kg/day) and twice daily dosing of enoxaparin (1 mg/kg/dose) for the treatment of thrombotic disease in certain populations has been well established in the literature. The purpose of this study is to determine if a computerized physician order entry (CPOE) enoxaparin order set implemented to reduce drug cost per day of therapy has translated into lower enoxaparin cost per day. A secondary aim is to assess if patients received the appropriate dosing strategy (once daily vs. twice daily) based on patient characteristics.
Methods: The health systems CPOE system was used to identify patients who received treatment doses of enoxaparin in a four month period before order set implementation (9/1/2008 - 12/31/2008) and a four month period after order set implementation (3/1/2009 - 6/30/2009). In this study subjects were matched based on weight (5 kg) and admitting service. A total of 400 subjects were matched, 200 in each group. The cost of enoxaparin was determined using wholesale acquisition cost. Appropriate dosing was assessed by verifying subject eligibility for once daily dosing from the subjects medical records. The two groups will be analyzed using the paired Students t-test (continuous variables) and McNemars test (dichotomous variables). This retrospective chart review study was approved by the Institutional Review Board.
Results: Pending

Learning Objectives:

Describe the development of a CPOE enoxaparin order set.

List three factors used to determine if a patient is eligible to receive once daily enoxaparin dosing.

Self Assessment Questions:

The CPOE enoxaparin order set at the University of Michigan Hospitals was designed to:
A. Decrease enoxaparin drug cost
B. Increase appropriate patient dosing
C. Force physicians to pick the correct enoxaparin dose
D. A and B
E. B and C

Which of the following factors makes a patient ineligible to receive once daily enoxaparin dosing?
A. CrCl > 30 ml/min
B. Weight > 150 kg
C. Receiving treatment for a DVT
D. Age > 55 years

FACTORS ASSOCIATED WITH THE SYSTEMIC ABSORPTION OF ORALLY ADMINISTERED VANCOMYCIN FOR THE TREATMENT OF SEVERE CLOSTRIDIUM DIFFICILE-ASSOCIATED DIARRHEA (CDAD)

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Purpose: Orally administered (PO) vancomycin is recommended for the management of severe CDAD. Despite widespread belief that absorption and systemic accumulation of oral vancomycin is negligible, elevated vancomycin plasma concentrations can occur in select patient populations or clinical situations: those receiving higher doses (>125 mg q6 hrs), renal failure, prolonged duration of therapy (>10 days), and inflammatory conditions of the gastrointestinal tract, including GVHD of the gut or severe CDAD. While higher vancomycin levels may be of concern for toxicity, lower levels may be of concern for the emergence of vancomycin-resistant strains of staphylococci. The resurgence in CDAD and resulting increased use of PO vancomycin may place certain patient populations at risk of elevated vancomycin plasma concentrations. The purpose of this prospective study is to identify factors associated with absorption and systemic accumulation of PO vancomycin.
Methods: All inpatients receiving PO (not intravenous) vancomycin in whom a random plasma concentration of vancomycin is obtained on day 5 of oral vancomycin therapy will be included. Data collection will include patient demographics, microbiology and laboratory values, comorbid conditions, vancomycin dosage, duration, and plasma concentrations of vancomycin. Adverse event data possibly-related to elevated vancomycin plasma concentrations will be collected until the end of therapy or discharge. IRB approval will be obtained prior to data collection and analysis. Data will be analyzed by two-tailed t-tests for continuous variables and Chi-square or Fischers exact test for categorical variables. A p-value ≤0.05 will be considered statistically significant. To identify risk factors associated with systemic absorption and accumulation of PO vancomycin, a multivariate logistic regression analysis of variables that were significant to a p-value of ≤0.20 in the bivariate analysis or that had a priori clinical significance will be conducted.
Results: Pending
Conclusion: Pending

Learning Objectives:

Identify potential factors associated with systemic absorption of PO vancomycin

Discuss the consequences of systemic absorption of PO vancomycin

Self Assessment Questions:

Which of the following factors/conditions have been reported to be associated with systemic absorption of PO vancomycin?
A.Renal failure
B.PO vancomycin dosed at 500 mg every 6 hours
C.Stage IV gastrointestinal graft-versus-host-disease (GVHD)
D.Prolonged duration of therapy (>10 days)
E.All of the above

Serum concentrations of vancomycin following PO administration can range from 1.4 mg/L (lower limit of detection for some assays) to >30 mg/L. While high levels (>20 mg/L) are of concern for the risk of toxicity, prolonged exposure to levels of <10 mg/L is problematic because such levels are associated with_____.
A.The development of resistant isolates of Staphylococcus aureus (VISA, VRSA)
B.A greater degree of nephrotoxicity
C.Increased risk for the development of antibiotic associated diarrhea
D.Increased risk of thrombocytopenia

COMPARISON OF CLINICAL OUTCOMES IN PATIENTS WHO RECEIVED ALEMTUZAMAB OR HIGH DOSE STEROIDS AS INDUCTION AGENTS IN LIVER TRANSPLANTS

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Since the introduction of calcineurin inhibitors patient and graft survival has significantly improved, however, there has been a minimum improvement in rejection rates. Although calcineurin inhibitors have been the mainstay of immunosuppressive regimens they have been associated with significant cardiovascular and renal adverse effects. To date, there are no current guidelines of selecting a specific induction agent or induction regimen for liver transplant recipients. Transplant centers around the country have implemented various induction protocols involving immunosuppressive agents. Recent literature has shown the use of antibody induction as a means to reduce the risk of acute rejection and avoid the nephrotoxicity of calcineurin inhibitors. Northwestern Memorial Hospital in recent years has adopted a protocol that does not utilize an antibody induction agent, and only uses high dose corticosteroids prior to transplantation. This study is a retrospective chart review analysis conducted at Northwestern Memorial Hospital between the years of 2002-2009. Alemtuzamab (Campath) was the induction agent of choice between the years 2002-2006, and intravenous methylprednisolone was used from 2006-2009. The objective of this study is to identify any differences in outcomes of liver transplant recipients that did or did not receive alemtuzumab at the time of transplantation. Primary outcomes include patient and graft survival and time to first rejection. Secondary outcomes will measure infectious complications, medical complications (NODAT), immunosuppression, liver function tests, and renal function. Inclusion criteria consisted of all liver transplant recipients greater than age 18 between the years of 2002-2009. Those with multi-organ transplants and those who were pregnant were excluded from this study.
Results: Data collection is currently in progress. Final results with conclusions will be presented at the Great Lakes Residency Conference in April 2010.

Learning Objectives:

To identify any differences in outcomes of liver transplant recipients that did or did not receive alemtuzumab at the time of transplantation.

To review current literature regarding induction agents in the liver transplant population and assess differences in the outcomes.

Self Assessment Questions:

1.True or False: Monoclonal Antibody agents are the gold standard as induction agents in liver transplants.

2.The most common adverse event associated with alemtuzamab induction was
a.Cardiac arrhythmias
b.Infection
c.Anemia
d.Infusion related reactions

PROPHYLACTIC USE OF COLONY-STIMULATING FACTORS IN FEBRILE NEUTROPENIA PATIENTS

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Purpose/Background: Chemotherapy-induced neutropenia is a serious, costly, and dose-limiting toxicity associated with chemotherapy, which can put a patient at serious risk for developing febrile neutropenia. The primary objective of this study is to identify patients admitted with febrile neutropenia to Grandview Medical Center and Southview Hospital between January 1, 2008, and October 31, 2009, and to determine if these patients received primary or secondary prophylaxis of febrile neutropenia with colony-stimulating factors (CSF).

Methods: This study will be a retrospective review of subjects that were admitted to Grandview Medical Center and Southview Hospital from January 1, 2008, to October 31, 2009, with a diagnosis of febrile neutropenia. Patients to be included in the study will initially be identified using the ninth revision of the International Classification of Diseases-Clinical Modification (ICD-9-CM) code of 288.00 or 288.03. In order to be included in the study, patients must have a diagnosed malignancy, received chemotherapy treatment up to 30 days prior to admission, and been a patient of Dayton Oncology and Hematology. Exclusion criteria includes any patient less than 18 years old, pregnant, or diagnosed with neutropenia and not receiving chemotherapy. Once the target group has been identified, each patients chart will be reviewed and data will be collected such as CSF usage prior to and upon admission to the hospital, age, the admitting hospital unit, chemotherapy regimen, white blood cell count (WBC), absolute neutrophil count (ANC), chemotherapy toxicity criteria (CTC) grade, death, albumin, serum creatinine, hemoglobin, lactate dehydrogenase (LDH), and maximum body temperature on the day of admittance. The first recorded value for each lab test mentioned previously will be collected.

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

Learning Objectives:

Recognize the appropriate subset of patients receiving chemotherapy who would benefit from primary prophylaxis with colony-stimulating factors.

Identify risk factors associated with the development of chemotherapy-induced febrile neutropenia.

Self Assessment Questions:

True/False: According to guidelines, patients receiving a chemotherapy regimen that is associated with febrile neutropenia in > 20% of patients should receive a colony-stimulating factor.

Which of the following is NOT a risk factor for chemotherapy-induced febrile neutropenia?
a.age ≥ 65 years
b.advanced stage of disease
c.previous episode of febrile neutropenia
d.previous history of chemotherapy or radiation
e.All of the above are risk factors

QUALITY OF CHRONIC DISEASE MANAGEMENT AND COMMUNITY PHARMACY; A REVIEW OF THE LITERATURE

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Purpose: Quality in healthcare, though difficult to define, relies on evidence-based standards, metrics and best practices. Pharmacist-based clinical services have shown the ability to improve healthcare quality, but there are currently few standards or quality metrics to evaluate these programs for best practices. This review will describe the quality of community pharmacy services in terms of standards, metrics and best practice to provide a model by which new programs can be developed and implemented.

Methods: A MEDLINE search of English language citations published between 1/1/1980 and 9/30/2009 will be identified and limited to the United States. The search will include the following MeSH terms: diabetes, hypertension, hyperlipidemia, quality indicators, healthcare; quality assurance, healthcare benchmarking; quality assurance, healthcare practice guidelines as topic; United States, community pharmacy services and medication therapy management. Articles will be included if they evaluated the quality of healthcare regardless of provider type so that multidisciplinary disease-specific best practices can be identified. In addition, the role of community pharmacy will be investigated. An internet search of government sponsored organizations will also be performed as oftentimes government documents are not available in MEDLINE. The scope of this review will be limited to finding standards, metrics and best practices in specific disease states such as: hypertension, hyperlipidemia and diabetes. The results of this project can be used to expand the role of pharmacists in chronic disease management.

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

Learning Objectives:

Describe the quality of hyperlipidemia, hypertension and diabetes management in terms of standards, metrics and best practices in a community pharmacy setting.

Discuss ways community pharmacy can implement quality improvement in chronic disease state management programs that can be used for expansion and reimbursement of clinical services in the future.

Self Assessment Questions:

The current U.S. healthcare system is focused primarily on the management of chronic diseases such as diabetes, hypertension, etc.

Pilot community pharmacy programs such as the Asheville Project and Diabetes Ten City Challenge have shown improvements in quality measures and total costs associated with the management of chronic disease states.

EFFICACY AND SAFETY OF CONTINUOUS INFUSION OF LABETALOL FOR LOWERING BLOOD PRESSURE IN INTRACEREBRAL HEMORRHAGE

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PURPOSE: Intracerebral hemorrhage (ICH) is a medical emergency involving a focal bleed resulting from a spontaneous rupture of a blood vessel. Management of ICH requires immediate reduction in blood pressure (BP) as this is one of the most common triggering events. Current American Stroke Association guidelines for BP management in ICH recommend the use of various antihypertensives including labetalol to achieve and maintain a goal systolic BP<160 mmHg. Despite limited published data about prolonged continuous infusions of labetalol in hypertensive emergencies in patients with ICH, continuous infusion labetalol is currently utilized at the Cleveland Clinic Neurology Intensive Care Unit (NICU). This study aims at evaluating the efficacy and safety of continuous infusion labetalol for management of hypertension in patients with ICH. The primary objective consists of describing the time and the labetalol dose required to achieve the BP target. Secondary objectives include determining the use of additional antihypertensive medications needed to achieve BP goal and assessing for adverse events related to prolonged antihypertensive medication administration.

METHODS: This is a retrospective chart review of patients admitted and treated for ICH in the NICU at Cleveland Clinic. Data to be collected include: age, sex, past medical history, antihypertensive medications received prior to admission, systolic BP, Glasgow Coma Score, location and size of hemorrhage on admission, total dose of labetalol required to achieve target BP, percent of time at goal, adverse reactions including hypotension (BP<90 mmHg), bradycardia (heart rate<60 bpm), abnormal liver function tests, and other rescue antihypertensive medications. If labetalol was replaced with a different continuously infused rescue antihypertensive medication, its use and dose will also be recorded. Descriptive statistics will be reported for key patient characteristics and treatment outcomes.

RESULTS: Data collection and analysis are in progress. Results and conclusion will be presented at Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Describe the pathophysiology of intracerebral hemorrhage

Discuss the recommended guidelines for treating elevated blood pressure in intracerebral hemorrhage

Self Assessment Questions:

Which of the following is NOT among the drugs recommended by the American Stroke Association for lowering of blood pressure in patients with intracerebral hemorrhage?
a. nicardipine
b. nitroprusside
c. hydralazine
d. metoprolol
e. nitroglycerine

What is the 30-day mortality rate after an intracerebral hemorrhage event?
a. 5-20%
b. 20-35%
c. 35-50%
d. 50-65%
e. 65-80%

EVALUATION OF ANEMIA IN POST KIDNEY, KIDNEY-PANCREAS AND ISOLATED PANCREAS RECIPIENTS

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Purpose: The prevalence of anemia is significant among various post solid organ transplantation populations. It is well-documented that anemia increases hospital length of stay, diminishes clinical outcomes, increases morbidity and mortality and affects patient quality of life. Effective anemia management is crucial to improve clinical outcomes post transplantation. Therefore, our Transplant Renal Care Committee implemented Transplant Iron and Erythropoietin Management Guidelines in March 2008 to standardize the treatment of anemia in our solid organ transplant patients. The primary objective of this study is to retrospectively evaluate anemia management pre- and post- guidelines in kidney (K), kidney-pancreas (KP), and isolated pancreas (IP) transplant recipients at The Ohio State University Medical Center (OSUMC).

Methods: This is a retrospective analysis of K, KP and IP transplant patients admitted to OSUMC. The pre- and post-guideline subject populations were selected from January 2006 through December 2006 and May 2008 through April 2009, respectively. The following data will be collected: patient's age, gender, type of transplant, maintenance immunosuppressants, hemoglobin levels, iron studies (serum iron total iron binding capacity, transferrin saturation, and serum ferritin), stool guaiac test results, patients past and current iron and erythropoietin therapy, and number of blood transfusions received. Continuous variables will be compared by the Student t-test for normally distributed variables and the Mann-Whitney U-test for non-normally distributed variables. Categorical variables will be compared by Fischers exact test. This study has been approved by the OSUMC Institutional Review Board.

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

Learning Objectives:

Recognize the impact of guideline-driven iron and erythropoietin management in post solid organ transplant patients.

Discuss the desirable hemoglobin and iron studies goals in post solid transplant patients treated with erythropoiesis-stimulating agents.

Self Assessment Questions:

Chronic kidney disease patients with anemia who are treated with erythropoiesis-stimulating agents have increased risk of which of the following if target hemoglobin is > 12 g/dL?
a) All-cause mortality
b) Myocardial Infarction
c) Poorly controlled blood pressure
d) Arteriovenous access thrombosis

True/False: Correcting iron deficiency is crucial for optimal erythropoiesis-stimulating agent treatment.

NESIRITIDE COHORT STUDY IN TOTAL ARTIFICIAL HEART PATIENTS

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PURPOSE: The goal of this study is to assess the safety of nesiritide in patients with a total artificial heart (TAH) at the Cleveland Clinic. The primary objective of the study is to assess the change in urine output in patients with a TAH who receive nesiritide. The secondary objectives are to assess: 1) the change in serum creatinine (SCr) in patients with a TAH who receive nesiritide 2) the incidence of hypotension 3) average daily nesiritide dose 4) average daily diuretic dose while on nesiritide therapy in comparison to baseline and in comparison to post-nesiritide therapy.

METHODS: Retrospective medical record review of patients who received a CardioWest TAH at the Cleveland Clinic and received therapy with nesiritide is included in the study. Patients who received a TAH but did not receive therapy with nesiritide were excluded. The following demographic data is being collected: age, gender, height and weight, heart failure diagnosis, heart failure duration, baseline ejection fraction, date of TAH, date of orthotopic heart transplantation (if applicable), date of expiration (if applicable). The following daily information from baseline up to 2 days after nesiritide therapy discontinuation is being collected: location (intensive care unit or regular nursing floor), TAH cardiac output/cardiac index, serum sodium, blood urea nitrogen, serum creatinine, daily fluid intake and output, nesiritide daily dose, daily diuretic dose, and vasopressor requirements. The following adverse events are being collected: number of incidents of hypotension (SBP <80 mm Hg), percent of patients experiencing hypotension. Descriptive statistics analysis will be used to evalute the data.

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

Learning Objectives:

Describe the pharmacology and use of nesiritide (Natrecor)

Review the role of nesiritide in total artificial heart (TAH) patients

Self Assessment Questions:

1. Which of the following are adverse reactions associated with nesiritide use?
a. Hypotension
b. Increased serum creatinine
c. Angina
d. Bradycardia
e. All of the above

2. What are some dose-dependent effects of nesiritide use?
a. Arterial and venous vasodilation
b. Increased cardiac output
c. Increased natriuresis
d. Increased diuresis
e. All of the above

RETROSPECTIVE REVIEW OF CYCLOPHOSPHAMIDE AND FILGRASTIM AUTOLOGOUS PERIPHERAL BLOOD HEMATOPOIETIC STEM MOBILIZATION IN PATIENTS WITH MULTIPLE MYELOMA

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Purpose:

Autologous hematopoietic cell transplantation has become the standard of care for patients with multiple myeloma (MM). Candidates for transplant undergo apheresis to harvest stem cells from the peripheral blood, which are cryopreserved and reinfused after chemotherapy to provide the stem cell rescue. Successful engraftment is dependent on an adequate number of CD34+ cells being mobilized from the bone marrow to the bloodstream via chemotherapy and colony-stimulating factors. MM patients at UCMC are mobilized with cyclophosphamide and filgrastim with a collection goal of 6-8 x 106 cells/kg. The purpose of this study was to describe the toxicity profile of cyclophosphamide plus filgrastim for auotlogous progenitor blood stem cell (PBSC) mobilization in patients with MM.

Methods:

The primary objective of this retrospective cohort study was to evaluate the impact of patient variables (age and performance status) on the safety and efficacy of PBSC mobilization with cyclophosphamide plus filgrastim in MM patients. Safety was determined by the incidence of febrile neutropenia, re-hospitalization, and transfusion support. Efficacy was determined by the stem cell yield following mobilization therapy. The secondary objective of this study was to determine patient populations whose incidence of febrile neutropenia and re-hospitalization exceeded 15%. Patients with MM who were mobilized with cyclophosphamide plus filgrastim from July 1st, 2001 to July 1st, 2009 at UCMC were evaluated for inclusion. Descriptive statistics were employed to identify toxicities resulting from mobilization therapy. Univariate and multivariate logistic regression modeling was utilized to illustrate the risk of rehospitalization and occurrence rate of febrile neutropenia. Linear regression was utilized to compare CD34+ pre-counts and yield with the pre-defined patient specific factors.

Summary of preliminary results:
To be presented

Conclusion:
To be presented

Learning Objectives:

Summarize the process of hematopoietic stem cell transplant for patients with MM.

Evaluate the impact of adding cyclophosphamide to filgrastim for mobilization on patient toxicity profiles and adverse events.

Self Assessment Questions:

Why is peripheral blood stem cell (PBSC) transplant preferred over traditional bone marrow transplants for patients with multiple myeloma?

Why is it necessary to mobilize stem cells into peripheral blood for autologous transplant?

EFFECTS OF ANTENATAL INDOMETHACIN EXPOSURE ON PATENT DUCTUS ARTERIOSUS (PDA) CLOSURE RATES IN PRETERM NEONATES.

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Purpose:
The two FDA approved pharmacological treatment options available for treatment of patent ductus arteriosus (PDA) are indomethacin (INDO) and ibuprofen lysine (IBU). When treated with pharmacologic therapy, approximately 15% of infants have a persistently patent ductus which requires additional pharmacologic therapy or surgical ligation. Tocolytic therapy with indomethacin, which inhibits prostaglandin-mediated uterine contraction, was found to be a risk factor associated with PDA treatment failure. The primary objective of this study is to determine if antenatal indomethacin affects the rates of PDA closure in premature infants when treated with either INDO or IBU. The secondary objective is to determine if neonates exposed to antenatal indomethacin developed more potential complications if they received postnatal INDO versus IBU.

Methods:
The health system's electronic medical record system will be used to identify infants who received indomethacin and/or ibuprofen lysine for PDA closure at the University of Illinois Medical Center at Chicago neonatal intensive care unit between July 1, 2006 and June 30, 2009. The following data will be collected: details of maternal tocolytic regimen and laboratory data, baseline characteristics of neonates, details regarding PDA treatment and efficacy, incidence of adverse effects, length of stay and mortality at 28 days. Closure and reopening rates, failure rates, surgical ligation rates and complication rates between treatment groups will be assessed statistically.

Results/Conclusion:
A total of eighty-three patients have received INDO and/or IBU during the study period. To date, data has been collected on twenty-three subjects (10 INDO group, 13 IBU group). Average gestational age and birth weight was 25.9 weeks and 899 grams and 27.4 weeks and 1005 grams, respectively, in the INDO and IBU groups. Final results and conclusions will be presented at the Great Lakes Pharmacy Conference.

Learning Objectives:

-Explain the mechanism of action of pharmacological treatment options for patent ductus arteriosus closure.

-Discuss effects of antenatal indomethacin on closure rates in neonates treated with indomethacin versus ibuprofen.

Self Assessment Questions:

The mechanism of action of indomethacin for the treatment of patent ductus arteriosus is:
a.Reversible induction of cyclooxygenase-1 and 2 (COX-1 and 2) enzymes, which results in decreased formation of prostaglandin precursors
b.Reversible inhibition of cyclooxygenase-1 and 2 (COX-1 and 2) enzymes, which results in decreased formation of prostaglandin precursors
c.Irreversible inhibition of cyclooxygenase-1 and 2 (COX-1 and 2) enzymes, which results in decreased formation of prostaglandin precursors
d.Irreversible induction of cyclooxygenase-1 and 2 (COX-1 and 2) enzymes, which results in decreased formation of prostaglandin precursors

(True/False)Antenatal indomethacin can potentially affect PDA closure rates.

TITLE: DEPRESSION AND IT'S TREATMENT - ARE THESE FACTORS OF COGNITIVE IMPAIRMENT IN MIDDLE-AGED ADULTS WITH A FIRST-DEGREE RELATIVE WITH ALZHEIMER'S DISEASE? EVALUATION OF THE WRAP (WISCONSIN REGISTRY FOR ALZHEIMER'S PREVENTION) DATA.

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Purpose: Recent estimates of the expected rapid increase in the prevalence of Alzheimer's Disease (AD) emphasize the importance of early detection, intervention and prevention. Limited studies of first-degree adult relatives of individual's with late-onset Alzheimer's Disease (AD) exist, but are thought to be at an increase risk for their own development of AD due to both genetic and environmental factors. Depression is thought to decrease cognition. Depression has been heavily studied to determine its prodromal relationship and the development of AD, but demonstrate varying results. Statistical improvement in MMSE scores were seen in depressed patients on antidepressant treatment. This study is designed to determine if depressed middle-aged adults of individual's with late-onset AD have reduced performance on cognitive functioning tests. It is also hypothesized that person's being treated with anti-depressant therapy have improved performance on cognitive functioning tests than depressed individuals with family history of AD not being adequately treated with pharmacological agents.

Methods: This is a cross-sectional analysis of data collected from Time 1 segment of participants in the WRAP study. The study is a prospective, longitudinal cohort of middle-aged adults aged 40-65 years of age at time of enrollment with a parent with the diagnosis of AD. Baseline assessments were conducted with all WRAP subjects and controls that included age, gender, race, education level, neuropsychological testing, APOE genotypes, past medical history, self-reported antidepressant use, and Center for Epidemiologic Studies Depression Scale (CES-D). Subjects were asked to self-report answers to questions regarding their general health, depression, and memory functioning. Data will be analyzed using a regression model to determine the effects CES-D scores on their performance of cognitive testing. An attempt to exclude data that may potentially confound the results will be made when analyzing the data.

Results: Data evaluation and analysis is currently ongoing.

Learning Objectives:

1.Determine if depression plays a role increasing rates of cognitive impairment thus increasing the risk of Alzheimer's disease in patients' with first-degree relatives diagnosed with severe stage Alzheimer Disease.

2.Identify if treatment of depression improves cognition scores initially and aids in reducing the risk for development of Alzheimer's disease.

Self Assessment Questions:

Of the following which, is not likely to cause alterations in cognition?
a.Depression
b.Vitamin D Deficiency
c.Vitamin B12 Deficiency
d.None of the Above

What score on the CES-D exam indicates depression?
a.≥7
b.≥12
c.≥16
d.≥18

IMPLEMENTATION OF A SEPSIS PROTOCOL AND ITS EFFECT ON PATIENT MORTALITY AND OUTCOMES AT A COMMUNITY-BASED TEACHING HOSPITAL

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Purpose: Sepsis is a cascade of events characterized by a profound inflammatory response to an infection which may result in vasodilatation, endothelial damage, end-organ damage, coagulopathy, and death. Despite the clear role of early identification and treatment to prevent further progression of the cascade, sepsis mortality rates remain high ranging from 30 to 50%. Based on the Surviving Sepsis Campaign guidelines, a multidisciplinary committee at The Jewish Hospital developed a sepsis protocol focusing on early goal-directed therapy. The purpose of this study is to evaluate the effect of an evidence-based sepsis protocol on clinical outcomes and mortality at a community-based teaching hospital.

Methods: This study is a single-center, retrospective chart review of patients with a primary or secondary diagnosis of sepsis, severe sepsis, or septic shock from November 1, 2007 to January 31, 2008 (pre-protocol implementation) and November 1, 2009 to January 31, 2010 (post-protocol implementation). Patients will be identified by the Performance Improvement Department using ICD-9 and/or DRG codes. Patients less than 18 years of age, hospice patients, and patients with incomplete medical records will be excluded. Electronic medical records and paper charts will be used to collect patient demographics, comorbidities, length of hospital stay, systemic inflammatory response syndrome criteria present, primary infection site, initial volume of fluid resuscitation, vasopressor administration, time to antibiotic administration, physician compliance with the protocol, and patient mortality.

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

Learning Objectives:

Describe the progression of the sepsis cascade.

Recognize the benefits associated with initiation of early goal-directed therapy.

Self Assessment Questions:

True or False: Broad-spectrum antibiotics should be administered within 1 hour of recognizing severe sepsis and septic shock.

Which of the following statements accurately represents a goal that should be achieved within the first 6 hours of initial sepsis resuscitation in a non-ventilated patient?

a. Central venous pressure 12-15 mm Hg
b. Central venous oxygen saturation ≥ 70% or mixed venous oxygen saturation ≥ 65%
c. Urine output ≤ 0.2 mL/kg/hour
d. Mean arterial pressure ≥ 70 mm Hg

IMPLEMENTATION OF A CLINICAL PHARMACIST MANAGED AMIODARONE MONITORING CLINIC

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Purpose:
Amiodarone is a class III antiarrythmic agent that is FDA approved for treatment and prophylaxis of life threatening ventricular arrhythmias, also used off-label for supraventricular arrythmias. Amiodarone has several potentially serious adverse effects including: pulmonary toxicity, cardiac conduction abnormalities, symptomatic bradycardia, hepatic toxicity, thyroid toxicity, and optic neuritis. The North American Society of Pacing and Electrophysiology (NASPE) guidelines recommend regular monitoring, which includes: thyroid function tests and liver function tests at baseline and every 6 months, chest x-ray and ECG at baseline and then annually, and serum creatinine, electrolytes, and pulmonary function tests (PFTs) at baseline and then as indicated. A medication use evaluation (MUE) completed at Edward Hines, Jr. Veterans Affairs Hospital (Hines VA) in 2003 showed that patients were not receiving all recommended monitoring. Electronic clinical reminders were implemented at Hines VA in the computerized patient record system (CPRS) in 2004 to improve monitoring frequency. After the implementation of clinical reminders, results in the frequency of monitoring were suboptimal. A clinical pharmacist managed amiodarone monitoring clinic will be created at Hines VA based on previous demonstration for the need to improve drug-monitoring.
Methods:
The study observation period is 28 months; 14 months before and 14 months after clinic implementation. All patients with an active prescription for amiodarone dispensed during the pre and post periods are included in the study. The VA pharmacy benefit management (PBM) clinical guidance and the North American Society of Pacing and Electrophysiology (NASPE) guideline were used in the development of monitoring parameters. Patient charts will be accessed through the CPRS.
Results:
Data collection is currently in progress. Data will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Discuss potential drug-induced toxicities of amiodarone and the recommended monitoring parameters and frequency

Explain the impact of amiodarone monitoring clinics previously reported in the literature on the rates of monitoring for adverse effects before and after their implementation

Self Assessment Questions:

T/F: Available literature suggests that patients are receiving optimal monitoring for potential drug toxicities of amiodarone

T/F: Although there are many potential toxicities of amiodarone, none have been fatal

COMPARISON OF JOB SATISFACTION BETWEEN RESIDENCY AND NON-RESIDENCY TRAINED VA PHARMACISTS

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Purpose: Staff turnover can impact a department by increasing costs for recruitment and training, and may negatively impact the departments productivity. Potential contributors to staff turnover are a low level of job satisfaction and lack of advancement opportunities. Several factors contribute to job satisfaction and may be associated with the type of services pharmacists provide. Completion of a pharmacy residency is often a prerequisite to positions that allow for a greater amount of medication therapy management or "clinical" activities. The objectives of this survey are to identify whether a difference exists between residency and non-residency trained Department of Veterans Affairs (VA) pharmacists in terms of job satisfaction and/or opportunities for career advancement.
Methods: A sixteen-question survey was designed to collect demographic data, level of job satisfaction, and opportunities for career advancement. Pharmacists were also asked to identify the top five most important factors impacting their job satisfaction. Modifications and clarifications were made to the survey after validation testing. The survey will be distributed via SurveyMonkey to pharmacists through internal electronic national VA pharmacist listservs. This includes pharmacists currently employed by, or co-funded with, the Department of Veterans Affairs, and excludes pharmacy residents.
Results/Conclusion: The analysis will include a comparison of job satisfaction, career advancement opportunities, and variables such as age and amount of daily clinical activities, between residency and non-residency trained pharmacists. The results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Discuss factors that have been found to impact pharmacist job satisfaction.

Identify whether or not residency training is associated with a higher level of job satisfaction.

Self Assessment Questions:

True or False: Job satisfaction and opportunities for career advancement impact voluntary turnover rates.

Which of the following factors have been found to impact pharmacist job satisfaction?a. Practice setting
b. Age
c. Amount of clinical activities
d. All of the above

VITAMIN D STATUS AT THE TIME OF TRANSPLANT AND 1 YEAR OF FOLLOW-UP

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Vitamin D status has been implicated to play a role in many processes important to the post-kidney transplant recipient, including bone loss, cancer, and possibly rejection and graft function. Despite this knowledge and possibly because of a lack of consensus on vitamin D supplementation in patients on renal replacement therapy, vitamin D insufficiency and deficiency are very prevalent in patients at the time of kidney transplantation.
The purpose of this analysis was to evaluate the 25-hydroxyvitamin D status of kidney recipients at the time of transplant and for up to a year of follow-up. Its relationship to acute rejection was also evaluated.
We retrospectively reviewed 63 kidney transplants from 1/2004 - 10/2008 to assess 25-hydroxyvitamin D status at the time of transplant and through one year of follow-up. Continuous data were analyzed using the Student t test and nominal data were analyzed using the Chi-square test.
Five patients (7.6%) were vitamin D sufficient (30+ng/mL) at the time of transplantation, 20 patients (30.6%) were vitamin D insufficient (15-29ng/mL), and 41 patients (62.3%) were vitamin D deficient (<15ng/mL). Thirty-nine (59%) of the 63 patients had follow-up 25-OH vitamin D levels monitored within 1 year after transplant. We found that vitamin D status improved throughout follow-up. The average change in 25-OH vitamin D level from baseline to peak level was 9 +/- 14ng/mL. Only 15% of patients had lower vitamin D levels at follow-up compared to baseline. No significant differences in rejection at 1 year can be seen in regards to baseline vitamin D status, although larger follow-up studies are necessary. Vitamin D sufficiency is very low at the time of transplant. Patients who are monitored and followed for vitamin D status appear to improve in status.

Learning Objectives:

Describe the physiologic roles of Vitamin D.

Explain the mechanism through which Vitamin D contributes to immune function.

Self Assessment Questions:

How does Vitamin D function in relation to the immune system?

What is the incidence of Vitamin D insufficiency at time of renal transplantation and how might this insufficiency be prevented?

AN EVALUATION OF PATIENTS WITH TYPE II DIABETES FOLLOWED BY THE PHARMACEUTICAL CARE CLINIC

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Purpose: Almost 8% of the United States population is affected by diabetes mellitus and the incidence is on the rise. In light of this problem, many studies, both prospective and retrospective, have supported the notion of pharmacist managed diabetes care clinics. Diabetes care services have been offered at the Pharmaceutical Care Clinic (PCC) since 2002 at the Cleveland Clinic. In the current study, the impact of pharmacist intervention on glycemic control will be assessed. This study will help provide insight on patient care at the PCC that will direct future care improvements at the Cleveland Clinic.

Methods: The primary objective of this study is to evaluate the change in HbA1c in patients with type II diabetes after referral to the PCC. This retrospective, chart review will include patients with an established diagnosis of type II diabetes managed by their primary care physician (PCP) for at least 6 months prior to PCC enrollment. Study subject baseline HbA1c must be greater than or equal to 7.5%. In addition, they must have had at least two visits with the pharmacist within 6 months at the PCC between 1/2004 and 11/2008. The primary endpoint is the change in HbA1c from baseline to 6 months after pharmacist intervention. A paired t-test will be used for analysis of changes of HbA1c from baseline to follow-up. The level of statistical significance will be set at $p < 0.05$ with a power of 80%.

Results/Conclusion: To be presented during the conference.

Learning Objectives:

Discuss the impact of improved glycemic control on microvascular and macrovascular outcomes

Review literature on pharmacist managed diabetes clinics

Self Assessment Questions:

Improving HbA1c reduces the risk of microvascular complications

Literature suggests that pharmacist managed diabetes clinics do not improve HbA1c outcomes

OPTIMIZING THE MANAGEMENT OF CANDIDEMIA AT A LARGE ACADEMIC MEDICAL CENTER USING AN ANTIMICROBIAL STEWARDSHIP PROGRAM DIRECTED APPROACH

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Purpose: Delay to effective treatment of candidemia has been shown to increase morbidity, mortality and hospital cost. The 2009 Infectious Diseases Society of America Practice Guidelines for the Management of Candidiasis recommend intravenous catheter removal and fluconazole or an echinocandin for initial therapy in most adult patients with candidemia. Historically, Candida glabrata has been the most prevalent non-albicans species isolated in candidemic patients at our institution making caspofungin the preferred empiric antifungal agent; however, a retrospective review of candidemia cases in 2008 revealed an increased incidence of Candida parapsilosis. Directed therapy should be guided by final culture and susceptibility data, and de-escalation to fluconazole should occur when appropriate in order to minimize potential selective pressure on Candida parapsilosis and cost in our institution. The objective of this study is to develop and implement a treatment algorithm for the management of candidemia and to evaluate the impact of the algorithm incorporating an Infectious Diseases Pharmacists intervention.

Methods: This study was submitted to the institutions Investigational Review Board for approval. An algorithm for the management of candidemia was developed and approved by the institutions multi-disciplinary Antimicrobial Stewardship Program that entails microbiology laboratory personnel paging an Infectious Diseases Pharmacist when yeast is identified on Gram Stain from a blood sample, thus enabling the pharmacist to collaborate with the physician to ensure appropriate management of candidemia with a focus on timely and appropriate therapy. These interventions will be retrospectively analyzed to determine the clinical and economic impact of the treatment algorithm and the pharmacists interventions.

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

Learning Objectives:

Outline treatment guidelines for the management of candidemia

Describe the process of developing and implementing a candidemia management algorithm incorporating an Infectious Diseases Pharmacists intervention

Self Assessment Questions:

Which of the following is recommended in the management of candidemia?
a) Removal of the intravenous catheter
b) Ophthalmology consultation
c) Empiric echinocandin or fluconazole therapy
d) All of the above

True or False. Fluconazole is effective in the treatment of candidemia associated with C. albicans, C. krusei and C. glabrata.

RETROSPECTIVE ANALYSIS OF THE SAFETY AND EFFICACY OF PHARMACOLOGICAL VENOUS THROMBOEMBOLISM PROPHYLAXIS IN PATIENTS WITH TRAUMATIC BRAIN INJURY

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Purpose: Traumatic injury is the leading cause of death for persons under the age of 40, with traumatic brain injury (TBI) accounting for a majority of these deaths. Venous thromboembolism (VTE) is known to be a common complication of trauma and severe TBI has been identified as a factor independently associated with an increased risk. Despite data supporting the safety of early pharmacological VTE prophylaxis in TBI patients, many practitioners are still reluctant to start pharmacological VTE prophylaxis because of the risk of hemorrhage extension. The current study aims to evaluate the safety and efficacy of pharmacological VTE prophylaxis in TBI patients.

Methods: This study is a retrospective chart review of patients with blunt or penetrating mechanism TBI by computed tomography (CT) scan who received pharmacological VTE prophylaxis at Methodist Hospital and Wishard Health Services from January 2008 through December 2009. The primary outcome is intracranial bleeding complications during VTE prophylaxis. Intracranial bleeding complications are defined as any enlargement of an existing hemorrhagic lesion by radiologist CT report or the development of a new hemorrhagic lesion at any time during a patients clinical course while the patient is receiving pharmacological VTE prophylaxis. Patients without repeat CT scans following the initiation of pharmacological VTE prophylaxis are assumed to not have had an intracranial bleeding complication. Secondary outcomes include the timing of VTE prophylaxis initiation, hospital mortality, and the incidence of VTE. A subgroup analysis comparing patients started on pharmacological VTE prophylaxis within 72 hours of admission and those started greater than 72 hours after admission is planned. Exclusion criteria include patients that are less than 18 years of age, incarcerated, pregnant, or have a heparin allergy.

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

Learning Objectives:

Identify risk factors for VTE in patients with traumatic injury

Discuss the literature supporting the early use of pharmacological VTE prophylaxis in TBI patients

Self Assessment Questions:

T or F Age greater than 40, lower extremity fractures, severe TBI, and major surgical procedures are all factors that are independently associated with an increased risk of VTE in trauma patients.

Which of the following are potential complications of inferior vena cave filters?
a.Recurrent DVT
b.Chronic venous insufficiency
c.Filter migration
d.Vena cava penetration
e.All of the above

OPEN-LABEL, PROSPECTIVE TRIAL OF MELATONIN TO REDUCE SUNDOWNING AND SLEEP DISTURBANCE IN HOSPITALIZED PATIENTS WITH DEMENTIA

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Purpose: To examine the efficacy of melatonin for improvement of sundowning and sleep disturbance in hospitalized patients with a primary diagnosis of dementia. This study will serve as a prospective pilot study to build the foundation for future research.

Methods: Pending IRB approval, this study will be an open-label, prospective trial comprised of fifteen patients with a primary diagnosis of dementia who experience sundowning, or increased arousal and agitation in the late afternoon. Each patient will be prescribed 4mg of melatonin daily at 18:00 for four weeks. Patients will be examined at baseline, two weeks, four weeks, and two weeks after medication discontinuation. Examinations will include the St. Louis University Mental Status Examination, Neuropsychiatric Inventory, the Pittsburgh Sleep Quality Index, the Orientation Log from the UAB Spain Rehabilitation Center, and neuropsychological evaluation. ANOVA will be performed on all rating scale data, with a p-value of ≤ 0.05 considered statistically significant.

Outcomes: The primary outcome will be reduction of 20% in the Neuropsychiatric Inventory. Secondary outcomes will be improvement in SLUMS, CERAD, and O-Log scores, "as needed" medication utilization, and improvement in sleep.

Results: This study is still pending Institutional Review Board approval.

Learning Objectives:

Discuss medication options available to treat sundowning and sleep disturbance in patients with dementia.

Identify the role of melatonin in a treatment strategy through examination of study outcomes.

Self Assessment Questions:

What pharmacologic agents are traditionally used in the treatment of sundowning in patients with dementia?

What is theorized to be the benefit of exogenous melatonin?

A NEW MODEL OF DIABETES CARE IN A FAMILY MEDICINE RESIDENCY CLINIC

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Purpose: This study will illustrate whether a new diabetes care model, which includes the provision of a Diabetes Care Coordinator as part of a multi-disciplinary team of health professionals in a family medicine residency clinic will improve glycemic control and level of satisfaction in patients with type 2 diabetes.
Methods: 59 Patients with type 2 diabetes were enrolled at the WW Knight Family Practice Center between September 1 and November 30, 2009. Baseline Hgb A1c levels and satisfaction surveys were collected.
Enrolled patients were cared for based on the new model of diabetes care, centered on a team-based approach and the provision of a diabetes care coordinator (DCC). The role of the DCC was filled by the pharmacy resident team member. The DCC had the daily responsibility to review charts of patients with upcoming appointments and provide reminders and suggestions to the patients physician and clinical staff. The DCC provided patient education materials and encouraged the setting of health goals for enrolled patients. The DCC and clinical pharmacy staff were also made available for consultation with regard to medication selection, dosing, etc. The DCC, with the help of a resident physician, clinical pharmacist & nurse educator provided education for the clinical staff throughout the study period.
Duration of follow-up is at least 3 months, with all follow-up terminating on March 31, 2010. At this time, final Hgb A1c levels will be drawn & satisfaction surveys will be repeated. Clinical faculty & staff also took baseline surveys & will take final surveys assessing their level of satisfaction with the offices approach to diabetes care.
Preliminary Results: At the time of this posting, there are no preliminary data available.
Conclusions: Conclusions are pending the collection of final data in March, 2010.

Learning Objectives:

Describe how patients with type 2 diabetes benefit from a team-based approach to their care.

Recognize the complexity & coordination of care involved in adhering to standards of diabetes care as defined by the American Diabetes Association.

Self Assessment Questions:

Who are the clinical staff involved in a patients diabetes care under this model?

Name 3 lab tests all patients with diabetes should have checked annually, according to the ADAs 2009 standards of diabetes care.

EVALUATION OF METHYLNALTREXONE USE IN A COMMUNITY HOSPITAL

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Purpose
Determine utilization of methylnaltrexone at Parkview Hospital. Methylnaltrexone was requested for addition to Parkview Hospitals formulary for treatment of postoperative ileus. Currently only case reports and anecdotal evidence support its use in this patient population. The primary objective of this study is to determine the use of methylnaltrexone at Parkview Hospital and its utility in post operative patients.

Methods
This study is a retrospective chart review to assess the utilization of methylnaltrexone at Parkview Hospital as well as in post operative patients. Patients greater than or equal to eighteen years of age that received methylnaltrexone during the study period were included. For determination of use in post operative ileus, patients were excluded if they received methylnaltrexone but did not undergo a surgical procedure, and if they received methylnaltrexone after receiving greater than fourteen days of opioid therapy. All patients that received methylnaltrexone that met inclusion criteria were evaluated for the following criteria: age, gender, creatinine clearance, type and length of procedure, use of alvimopam, use of opioid analgesia, use of gastrointestinal motility agents, use of laxatives, pain assessment, time to first flatus and bowel movement, length of stay, days of nasal gastric tube utilization, days of total parental nutrition, and safety. Patients were compared to historical controls.

Results/Conclusion
Data is still being collected. Results for all patients receiving methylnaltrexone and conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:

Identify non-palliative care patients that may benefit from methylnaltrexone.

Explain the rationale for methylnaltrexone use in post operative ileus.

Self Assessment Questions:

True or False: Post operative ileus is the cessation of coordinated bowel movement that prevents effective transit of gastrointestinal tract contents

True or False: Methylnaltrexone is FDA approved for the treatment of post operative ileus.

IMPLEMENTATION OF A PHARMACIST-MANAGED IMMUNIZATION CLINIC IN AN INDEPENDENT COMMUNITY PHARMACY

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Purpose:
To be a vaccine advocate and provide routine and recommended immunization services and education to at-risk individuals to avoid vaccine-preventable diseases and to improve patient care.
The primary objective for this project is to improve patient access to immunization services by implementing a pharmacist-managed immunization clinic at Wellspring Pharmacy North by March 2010.

Background:
Approximately 50,000 adults in the United States die each year due to complications from vaccine-preventable diseases. The total economic cost of treating vaccine-preventable diseases among adults exceeds $10 billion dollars each year. Although effective vaccines to prevent these diseases are available, they are widely underutilized. Pharmacists are especially valuable because they can identify candidates for immunization and educate them on the importance of vaccinations. Pharmacy-based immunization clinics play an important role in educating their community about vaccine-preventable diseases and providing vaccination services at easily accessible locations and convenient times.
Methods:
Prior to implementation, we submitted a formal immunization clinic proposal for approval by senior leadership. Once approved, we identified American Pharmacist Association (APhA) immunization-certified pharmacists at Wellspring Pharmacy and requested their participation in the immunization service. To determine the most commonly prescribed vaccines and to develop a marketing strategy, we evaluated the vaccine prescribing history of physicians within the Community Health Network ("Network"). We developed an adult vaccine protocol and established clinic hours for immunizations appointments. Our target population are patients who are at least 18 years old. We will exclude patients who are pregnant or immunocompromised as defined by the Advisory Committee on Immunization Practice (ACIP). A collaborative practice agreement was established for seasonal and H1N1 influenza vaccines, while all other vaccinations will require a prescription by the patients physician.

Results/Conclusion:
The implementation phase of this project is ongoing and the results will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Describe the potential barriers pharmacists face when implementing an immunization program.

Define the steps required to implement an immunization clinic in your pharmacy.

Self Assessment Questions:

All of the following are advantages of immunization services in community pharmacies, EXCEPT:
a.Pharmacies are easily accessible to patients
b.The pharmacy has convenient hours
c.The pharmacist can quickly identify candidates for immunization
d.The pharmacist lacks knowledge of immunizations

Which of the following is/are important consideration(s) when implementing an immunization clinic?
a.Immunization-certified pharmacist(s)
b.Support from pharmacy staff
c.Access to a private consultation area for immunizations
d.All of the above

IDENTIFYING PATIENTS AT RISK FOR DEVELOPING DELIRIUM: DEVELOPING A PHARMACIST BASED RISK FACTOR ASSESSMENT

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Purpose
The purpose of this research is to develop and validate a risk factor assessment which identifies patients at risk of developing delirium in the intensive care unit (ICU).

Methods
Thirty risk factors will be applied to each patient in the developmental cohort. These ICU patients will have surrogate markers for delirium including at least one of the following, haloperidol or atypical antipsychotic use, restraint use, mental status change, delirium, and hallucination. Frequencies of each risk factor in each patient will be collected. Risk ratio will be calculated for each risk factor. Prediction of delirium risk based on number of risk factors present in each patient will be generated. Fifteen risk factors with the highest risk ratio will be selected and utilized in the validation part of the research.

Validation of the fifteen risk factors will be performed in the second cohort. This cohort will consist of 200 consecutively admitted ICU patients. Risk factor assessment and prediction of delirium risk will be performed on the second cohort. After this assessment is performed, the surrogate markers of delirium will be applied. Risk factor assessment will be tested for concordance with the surrogate markers of delirium in the validation cohort. A comparison will be made between patients who were considered delirious by the surrogate markers and the risk factor assessment. Prediction of delirium risk will be compared to occurrence of delirium based on surrogate markers, this comparison will determine if assessment accurately predicts delirium risk. Risk ratios will be generated for each risk factor and will be compared to the risk ratios obtained from the developmental cohort study to determine amount of variability for each risk factor.

Summary of results and conclusion reached
Research is ongoing and results will be reported at Great Lakes Residency Conference.

Learning Objectives:

Define the current methods for detecting delirium in an ICU setting

Define the current methods for predicting delirium

Self Assessment Questions:

1)What predisposing risk factors did Inouye find to be predictive of delirium in 1993?
i)vision impairment
ii)severe illness
iii)cognitive impairment
iv)BUN/SrCr >18
v)All of the above

2)True/False, In 2007 Inouye found that 70% of medical ICU patients experienced delirium within 48 hours of admission to the ICU

GENOTYPE AND PHENOTYPE COMPARISON OF NOSOCOMIAL AND COMMUNITY ACQUIRED E. COLI ISOLATES PRODUCING EXTENDED SPECTRUM BETA-LACTAMASES

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Purpose:
Gram negative bacteria frequently produce beta-lactamases. Escherichia coli, a Gram negative bacteria, can express extended spectrum beta-lactamases (ESBLs) that render many cephalosporins resistant. Historically, infections associated with ESBLs have been primarily nosocomial in origin; however, the prevalence of community acquired infections caused by ESBLs (caESBLs) has been increasing worldwide and recently in the United States. ESBLs primarily fall into the genotype groups SHV, TEM, or CTX-M based on amino acid sequence homology. Little is known about susceptibility (phenotypes) and genotype differences between nosocomial and caESBL E. coli. The purpose of this study is to determine the genotypes and phenotypes of ESBL producing E. coli strains, stratified by nosocomial or community acquisition.

Methods:
A total of 334 unique E. coli isolates collected from inpatient and outpatient specimens between 2003 and 2008 stored at the clinical microbiology laboratory of Northwestern Memorial Hospital in Chicago IL were included. Isolates with elevated MIC (MIC > 2 g/ml) determined by the VITEK II system for any one of the three drugs, aztreonam, ceftazidime, and ceftriaxone were confirmed as ESBLs using the double disk diffusion method as described by the Clinical Laboratory and Standards Institute (CLSI). Test isolates were grown initially from frozen stores on 5% sheep blood agar, and crude genomic DNA was extracted from the isolates by heat lysis. DNA analysis was performed using polymerase chain reaction (PCR) with a GeneAmp thermal cycler using specific primers for beta-lactamase genes (blaTEM, blaSHV, blaCTX-M). Antimicrobial susceptibilities of the study strains to cefepime, aztreonam, imipenem, ertapenem, ciprofloxacin, gentamicin, amikacin, sulfamethoxazole-trimethoprim, nitrofurantoin and fosfomycin were determined using standard agar dilution methods as defined by the CLSI. Standard descriptive and inferential statistics will be performed as necessary.

Results:
Results to be presented at the Great Lakes Pharmacy Resident Conference

Learning Objectives:

Describe the distribution of genotypes between nosocomial and community acquired ESBL E. coli isolates.

Identify variations in susceptibility patterns between different ESBL E. coli genotypes.

Self Assessment Questions:

True or False: Organisms producing extended spectrum beta-lactamases are commonly resistant to antibiotics used treat gram negative infections.

True or False: CTX-M enzymes are an example of plasmid acquisition of beta-lactamase genes.

ANALYSIS OF PHARMACY SERVICES IN AURORA HEALTH CARE CLINICS

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Purpose: The purpose of this project is to compile a list of the current pharmacy services provided in the Aurora Health Care Clinics, assess opportunities for additional services based on patient and provider needs, and recommend possible services that are within the scope of Auroras long-term strategic plan.
Methodology: The literature was reviewed for current pharmacy services provided in ambulatory healthcare settings. Phone surveys were conducted to interview the pharmacy directors of other integrated health care systems, as well as an in person interview with the manager of ambulatory services to assess current pharmacy services provided in the Aurora clinics. A written survey was developed to determine the needs of clinic managers and clinic providers to expand pharmacy services. Financial analysis will be performed to assess the financial feasibility of implementing additional pharmacy services. Recommendations will be made based on the overlap between financial and operational feasibility and provider interest.
Results/Conclusions: Data collection is in progress; preliminary results and recommendations will be presented at Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Describe one approach to assess the need for pharmacy services in outpatient clinics

Provide examples of clinic differences that should be considered when developing pharmacy services.

Self Assessment Questions:

Clinic managers, medical directors and pharmacists were surveyed to assess the need for pharmacy services in Aurora clinics. T or F

Current pharmacy services include retail pharmacies in several Aurora clinics. T or F

HYPERGLYCEMIA IN STEM CELL TRANSPLANT RECIPIENTS: EFFECTS ON TRANSPLANT RELATED MORBIDITY AND MORTALITY

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PURPOSE:
Currently there is data to suggest that particular subgroups of critically ill patients have morbidity and mortality benefit when the patients blood glucose is tightly controlled. However, to date, there is limited data with regards to glucose control and the morbidity and mortality benefit in hematopoietic stem cell transplant (HSCT) patients. The purpose of the study is to determine if glucose control, defined as mean blood glucose ≤ 140mg/dL, in patients who underwent HSCT provides decreases mortality and morbidity when controlling for potential confounding factors. Should this research conclude that controlling blood glucose has a positive effect on morbidity and/or mortality, the more global purpose is to create a clinical care guideline which addresses glucose control of patients who undergo a HSCT.
METHODS:
This study is a retrospective chart review of patients undergoing HSCT at University of Illinois Medical Center Chicago (UIMCC) between January 1, 2003 and January 1, 2008. Patients were identified using the transplant coordinators database. Patients were included if they were at least 18 years of age at the time of transplant and receiving his/her first HSCT. Demographic data collected includes: age, past medical history, transplant type, and conditioning regimen. Additional data collected includes: blood glucose, death, disease relapse, febrile neutropenia, graft versus host disease, time to engraftment, engraftment within Patients were then stratified by mortality and morbidity outcomes, including: engraftment within 30 days, documented infection, febrile neutropenia, and graft versus host disease. Potential confounding factors will also be taken into consideration in order to strengthen our statistical analysis. This will also assist in determining if the difference seen is due to glucose control alone.
RESULTS:
Data collection is in progress. Final results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Describe the factors which predispose patients undergoing HSCT to hyperglycemia.

Discuss the morbidity and mortality outcomes which impacted by glucose control in HSCT patients.

Self Assessment Questions:

True or False: Intensive glucose control has been found to decrease mortality in all critically ill patients.

Which of the following predisposes a patient undergoing HSCT to develop hyperglycemia.
a.Conditioning Regimen
b.TPN
c.Steroid treatment
d.All of the above

RETROSPECTIVE ANALYSIS OF ANTIMICROBIAL UTILIZATION IN A RURAL MEDICAL CENTER

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Purpose: Unsupervised use of antimicrobial agents can lead to increased resistance in bacteria. Antimicrobial surveillance is an important step in decreasing rates of resistance in bacteria and treatment failures. Ensuring proper antimicrobial prescribing and use is a vital step in reducing antibiotic resistance rates. Rural healthcare settings do not always have the benefit and expertise of infectious disease specialists. Often, the responsibility is left to the pharmacist to ensure accurate prescribing and monitoring of antibiotics. The purpose of this study is to analyze antibiotic prescribing habits in the institution, and to investigate the feasibility of establishing a multi-disciplinary antimicrobial stewardship committee.

Methods: Retrospective chart review will be conducted for specific antimicrobial agents considered significant based on utilization, associated increased risk for developing resistance, formulary restrictions, and cost. Data will be collected from January through December 2009 on appropriate prescribing, dosing, length of therapy, and selection based on cultures. Any incidental findings relevant to the utilization of the specific agents will also be recorded. Data will be analyzed to determine any prescribing habits that may warrant intervention by the pharmacist. The results will be compiled and recommendations to improve antimicrobial utilization will be presented to the appropriate committees within the institution. The intended outcome of this study will be to establish a multi-disciplinary antimicrobial stewardship committee, and institute prospective antibiotic surveillance conducted by the pharmacy department for high-alert agents.

Results: Data collection is currently in process. The results and conclusions of this study will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Discuss the importance of antimicrobial surveillance in a rural healthcare setting.

Explain the issues related to instituting an antimicrobial stewardship program in a rural healthcare setting.

Self Assessment Questions:

T/F Overuse of antibiotics leads to bacterial resistance, resulting in increased morbidity and mortality.

T/F Daptomycin is FDA approved for the treatment of vancomycin resistant Enterococcus infections.

JUSTIFICATION AND IMPLEMENTATION OF A PATIENT ASSISTANCE DRUG RECOVERY PROGRAM IN THE SETTING OF AN OUTPATIENT INFUSION CENTER

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Purpose: To determine if implementation of a patient assistance drug recovery program at Saint Joseph Regional Medical Center results in substantial hospital cost savings and provision of medications to the indigent patient population. To create a sustainable program that provides consistent financial and community outreach benefit.

Methods: The current research plan involves identifying drug products with substantial cost savings potential as well as potentially eligible patients. Websites that identify available patient assistance programs will be utilized (www.needymeds.org). Reports generated from hospital computer systems will aid in identifying eligible patients. Once eligible patients have been identified, they will be notified and enrolled in the program upon registration for infusion center services. A registration packet addendum has been developed to disclose necessary patient information and obtain consent. All reimbursement paperwork required by pharmaceutical companies will be processed during or after the patients stay with the infusion center. Efforts will be coordinated between the patient, the Patient Financial Services Eligibility Assistance Department, the outpatient infusion center, and the pharmacy. Measured indicators include the acquisition cost of the drug to the hospital, charge to the patient, those charges paid by the hospital in the event that a patient is unable to pay, and the time required to cycle each patient through the system will also be captured. During the time of the study, development of a prescreening system to identify employment status, insurance status, and income is likely. Eligible patients can be identified earlier in the registration process, and pharmaceutical reimbursement paperwork can be expedited. It is recognized that this method may actually limit enrollment, if hospital prescreening criteria are more stringent than the patient assistance program criteria.

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

Learning Objectives:

Recognize potential benefits (to both patients and health systems) of utilizing pharmaceutical company-sponsored patient assistance programs

Identify the role of the pharmacist in the patient assistance program enrollment process

Self Assessment Questions:

T/F - One online resource that can be utilized by pharmacists for information about patient assistance programs can be found at www.needymeds.org

T/F It is likely that with the implementation of an effective patient assistance drug recovery program, both patients as well as the health-system will benefit

ASSESSING THE RENAL CONSEQUENCES AND FUNCTIONAL EFFICACY OF LOW DOSE HYPERTONIC SALINE SOLUTION AND FUROSEMIDE FOR THE TREATMENT OF CONGESTIVE HEART FAILURE

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PURPOSE: Diuretic resistance and renal function decline remain complicating factors in the treatment of acute congestive heart failure (CHF). The objective of this study is to determine whether high dose furosemide in combination with low volume hypertonic saline solution (HSS) provides effective diuretic response and has beneficial effects on preserving renal function compared to furosemide alone in hospitalized patients with pre-treatment renal impairment.

METHODS: This randomized, double blind, double dummy, prospective study has been approved by the Institutional Review Board. Participants experiencing uncompensated congestive heart failure based on Framinghams criteria for heart failure and with a glomerular filtration rate (GFR) less than or equal to 60 mL/min, were enrolled. Exclusion criteria include acute coronary syndrome, surgery within the last 90 days, patients on dialysis, enrollment in palliative care, or less than 18 years of age. Participants meeting inclusion criteria will be randomized to either treatment 1 or treatment 2. Participants in treatment group 1 will receive 250 of furosemide in 150 ml of HSS over 30 minutes intravenously twice a day, while treatment group 2 will receive 80 mg of furosemide intravenous push. Physicians may discontinue blinded treatment if the participant is experiencing ineffective diuresis, worsening GFR, or adverse clinical response. The following data will be collected: actual body weight, blood pressure, heart rate, B-type natriuretic peptide, physical exam, CHF symptoms, New York Heart Association class, chest radiograph, electrocardiogram, echocardiogram if clinically indicated, basic metabolic panel, uric acid, albumin, fluid status, and side effect assessment. The primary outcome will be the percent change in GFR from admission to the minimum GFR value during hospitalization. To test the primary hypothesis, a t-test comparing the mean outcomes between treatment groups will be performed. Safety endpoints include the incidence of side effects, specifically hypotension and tinnitus.

Learning Objectives:

Describe the need for alternative pharmacologic interventions for the treatment of acute decompensated heart failure in patients with preexisting renal dysfunction.

Identify treatments of acute decompensated congestive heart failure.

Self Assessment Questions:

Which is not included in Framinghams Criteria for heart failure?
a) Acute pulmonary edema
b) Bradycardia
c) Neck vein distention
d) Paroxysmal noctural dyspnea
e) None of the above

True or False: Diuretic resistance may result in a progressive increase in diuretic therapy.

IMPACT OF ACIDEMIA AND/OR HYPOTHERMIA ON THE RISK OF BLEEDING IN PATIENTS RECEIVING DROTRECOGIN ALFA FOR SEVERE SEPSIS

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Background:
Drotrecogin alfa (APC) has been shown to improve survival in patients with severe sepsis. However, concern exists with its risk of bleeding.

Purpose:
To evaluate if acidemia and/or hypothermia increases the risk of bleeding among patients receiving APC for severe sepsis.

Methods:
This retrospective study over 5.5 years ending July 2009 evaluated patients receiving APC for severe sepsis. Acidemia was defined as arterial pH ≤ 7.2 and hypothermia as core temperature ≤ 35C. The primary outcome was bleeding events. Serious bleeding was defined as patients having intracranial hemorrhage, retroperitoneal bleeding, the need for 3 units of PRBC on 2 separate days or other life-threatening bleeding. A p-value < 0.05 was considered significant.

Results:
The study included 70 patients with a mean age of 5216 and 61% were African American. The mean APACHE II in all patients was 288. Forty one (58%) patients had acidemia and 21 (30%) had hypothermia. No difference in bleeding events were observed in patients with acidemia (p=0.58) or hypothermia (p=0.95). Bleeding events occurred in 17 (24%) patients who received APC, 4 had a serious bleeding event. A trend towards increased bleeding occurred in patients with both acidemia and hypothermia (p=0.15). The number of bleeding events occurred more frequently in patients receiving bicarbonate therapy (p=0.01). Hemoglobin (Hgb) ≤ 8 on day 2 of APC was associated with a higher rate of bleeding, p=0.04. Additionally, platelets ≤ 100,000/mm3 on day 3 of APC had more bleeding, p=0.04. Bleeding events did not impact in-hospital mortality (p=0.33). However, mortality increased in bleeding patients with a BMI ≥35 (p=0.007) and when Hgb was ≤ 8 g/dL (p=0.04) on day 1 of APC infusion.

Conclusions:
Bleeding occurred more frequently in patients on APC who had acidemia with hypothermia, bicarbonate therapy, anemia or thrombocytopenia. In-hospital mortality was affected by obesity and anemia in bleeding patients.

Learning Objectives:

Describe the evidence supporting APC in severe sepsis.

Discuss the effects of hypothermia and acidemia on coagulation and the role of in coagulopathy.

Self Assessment Questions:

What are the mechanisms of action of APC?

What two factors, independently affect coagulation as described in the trauma population?

FONDAPARINUX WITH ADJUNCTIVE ANTITHROMBOTIC THERAPY VERSUS BILVALIRUDIN MONOTHERAPY IN PATIENTS UNDERGOING PERCUTANEOUS CORONARY INTERVENTION

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Purpose: Bivalirudin is a direct thrombin inhibitor approved for use in patients undergoing percutaneous coronary intervention (PCI). Fondaparinux is a synthetic pentasaccharide that selectively binds and inhibits antithrombin and factor Xa. Both agents have been shown to decrease the risk of bleeding in patients undergoing PCI; however, fondaparinux was associated with an increased risk of guiding catheter thrombosis. The objective of this study is to compare bivalirudin monotherapy to fondaparinux with provisional adjunctive antithrombotic therapy in PCI.

Methods: The Institutional Review Committee at Saint Joseph Health System approved this retrospective, single center, paired data observational study. The health systems electronic medical record database was used to identify all patients whom received fondaparinux with provisional antithrombotic therapy or bivalirudin monotherapy prior to undergoing PCI at Saint Joseph East between January 2007 and July 2009. Patients whom received an injectable anticoagulant other than fondaparinux, bivalirudin, or heparin prior to PCI were excluded from the study. Patients were matched from the fondaparinux group to patients in the bivalirudin group via baseline characteristics. Data collected included: baseline characteristics, length of stay, anticoagulation therapy, thrombotic or embolic events requiring interventions, TIMI major or minor bleeding and required interventions, and mortality related to PCI procedure.

Results: Preliminary data has been collected and reviewed. During the study period, 1154 patients underwent PCI at Saint Joseph East. Forty patients were identified whom received fondaparinux prior to PCI and met the other inclusion and exclusion criteria. Baseline characteristics of these patients were reviewed and matched in a 1 to 3 ratio to patients that were identified as receiving bivalirudin monotherapy. Statistical analysis of the collected data will be completed and presented in April 2010.

Learning Objectives:

Identify the possible complications from improper antithrombotic therapy in percutaneous coronary intervention.

Recall the approved antithrobotic therapies for use in percutaneous coronary intervention.

Self Assessment Questions:

Which therapy is approved for use in PCI?
A.Bivalirudin
B.Fondaparinx
C.Heparin
D.A&C
E.B&C

What is a possible consequence of inappropriate antithrombotic therapy during PCI?
A.Thrombosis
B.Pancytopenia
C.TIMI minor bleeding
D.All of the above
E.Two of the above.

EPIDEMIOLOGY OF HYPONATREMIA (HN) DURING ACUTE SPONTANEOUS INTRACEREBRAL HEMORRHAGE (SICH)

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Background:
Sodium (Na) abnormalities are common following acute neurologic injury, however, little data exists describing the incidence and etiology in sICH.

Purpose:
Determine the incidence and etiology of hyponatremia in a neuro intensive care unit after sICH.

Methods:
A retrospective analysis of consecutive patients (pts) admitted for sICH between January 2006 and June 2008 was conducted. All plasma Na levels were recorded for pts during the ICU stay. HN was defined as Na <135 mmol/L.

Results:
A total of 99 pts and 328 serum Na measurements were analyzed with HN developing in 23% of sICH pts. Most pts (89%) had euvolemic or hypervolemic HN, suggesting the etiology of syndrome of inappropriate antidiuretic hormone (SIADH) secretion. No difference was found in the development of in-hospital complications or mortality, including seizures and cerebral edema. Pts with HN had a longer ICU [8(2-32) vs 4(1-42) days; p=0.001] and hospital [13(2-40) vs 6(1-52) days; p<0.001] lengths of stay. HN development itself was not associated with increased mortality; however, a large variability of serum Na, as assessed by standard deviation, increased mortality (p=0.005). Pts that developed HN had a greater serum Na variability (4.8 2) vs normotremic pts (3.5 2 mmol/L; (p=0.036).

Conclusion:
HN following sICH occurs primarily during the first week, however there was a second occurrence of HN during week two following sICH which may be clinically important for follow-up after discharge. Based upon clinically available data, the most likely etiology is SIADH, since very few pts were hypovolemic. A large variability in serum Na measurements is associated with increased in-hospital mortality in pts with sICH, and HN is associated with longer lengths of stay. Further study is necessary to characterize the clinical relevance and treatment of HN in this population.

Learning Objectives:

Identify the common cause(s) of hyponatremia in neuro intensive care patients.

Discuss the consequences of hyponatremia in patients with neurological injuries.

Self Assessment Questions:

What is/are the main differentiating symptom(s) between Cerebral Salt Wasting Syndrome and Syndrome of Inappropriate Antidiuretic Hormone?
a.Volume statusc. Central venous pressure
b.Serum sodiumd. a and c

Which of the following is not a consequence of hyponatremia in neuro critical care patients?
a.Seizuresc. Atrial fibrillation
b.Cerebral edema d. Herniation

EVALUATION OF DKA MANAGEMENT AT AN ACADEMIC MEDICAL CENTER

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PURPOSE: Specific guidelines exist for the management of diabetic ketoacidosis. Treatment involves a complex regimen of insulin, fluids, and electrolytes to achieve safe but rapid reversal of the condition. Difficulty with compliance to these guidelines has been identified in multiple health-systems. Identification of those interventions and treatment variables that are most impactful on patient outcomes and cost of care would help target programs for improvement in care of patients with diabetic ketoacidosis. We intend to identify variations in DKA treatment that have a significant impact on patient stay in the hospital and intensive care units (ICU).

METHODS: A retrospective analysis is being conducted using the University HealthSystem Consortium (UHC) Clinical Database and patient chart review. Adult patients were selected who presented to the emergency department with a primary diagnosis of diabetic ketoacidosis between April 2006 and April 2009. Data will be collected regarding length of stay, type and amount of insulin, fluid and electrolyte administration. Times to glucose normalization, resolution of ketonemia, and resolution of acidosis will be determined. These factors will be compared between groups and correlated to hospital and ICU length of stay.

RESULTS: Of the initial 165 visits representing 123 unique patients, 53.3% (88 visits) resulted in ICU admission. Total length of stay averaged 2.6 days for visits not admitted to the ICU, while average stay for patients requiring intensive care stayed an average of 8.8 days, including 2.6 days of ICU care. Correlation to treatment and baseline characteristics has not yet been performed as chart review is still underway.

CONCLUSIONS: Preliminary analysis is limited, though chart review should be mostly complete by the time of presentation. It is clear that DKA results in numerous single and repeat visits, and optimization of care would be advantageous.

Learning Objectives:

Identify appropriate insulin regimens for patients with DKA.

Discuss electrolyte considerations for patients with DKA.

Self Assessment Questions:

True/False: Subcutaneous insulin is never appropriate for patients with DKA.

Which electrolyte should be treated based on adjusted rather than directly measured values in DKA patients?

A)Sodium
B)Potassium
C)Phosphorous
D)Magnesium

CASE-CONTROL STUDY TO IDENTIFY CLINICAL RISK FACTORS FOR PACLITAXEL-RELATED NEUROTOXICITY

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PURPOSE: Paclitaxel is one of the most active cytotoxic agents in the treatment of breast cancer, in both the adjuvant and metastatic settings. The most common side effects are myelosuppression and peripheral neuropathies. Dose-related neuropathies (55-79%) usually resolve in 30-60 days; however, irreversible neuropathies have been reported. Higher rates of toxicities, such as neutropenia or neurotoxicity, may lead to longer times to completion of treatment, decreased intensity of therapy, or early discontinuation. These interruptions in therapy may not only effect successful treatment of a patients cancer, but neuropathy may significantly impact their quality of life and activities of daily living for years beyond their breast cancer. Paclitaxel neuropathy is known to be associated with dose given per cycle, cumulative dose, infusion duration, and treatment schedule; however, there are currently no established predictive markers for who will be most at risk for the development of severe peripheral neuropathies given identical treatment plans. This retrospective, observational, cohort study will examine baseline patient demographic variables, such as age, race, past medical history, concurrent medications, and social history, to identify correlations in the development and severity of peripheral neuropathies.

METHODS: Cases of severe peripheral neuropathy will be compared to control cases of no neuropathy in a cohort of 200 female patients > 18 years of age with breast cancer who have previously received treatment with paclitaxel or albumin-bound paclitaxel. Severe neuropathy will be defined as Grade 3 or 4 per NCI-CTC, affecting a patients activities of daily living, or resulting in dose reduction or discontinuation of therapy. Patients will be identified from Indiana University Simon Cancer Center Sunrise Disease Manager database and data collected via chart review.

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

Learning Objectives:

Describe factors associated with increased risk of neuropathy in paclitaxel-treated patients.

Describe potential consequences of paclitaxel-associated neuropathies.

Self Assessment Questions:

Which of the following are consequences of developing severe neuropathy in during treatment of breast cancer:
a. Early discontinuation of therapy
b. Dose reductions
c. Balance and gait abnormalities
d. All of the above

Which of the following is considered a dose limiting toxicity of paclitaxel?
a. Alopecia
b. Nausea
c. Neurotoxicity
d. Hand-food syndrome

DEVELOPMENT, IMPLEMENTATION, AND EVALUATION OF A PHARMACIST-CONDUCTED SCREENING AND EDUCATIONAL INTERVENTION FOR DEPRESSION

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Purpose: Depression is a common and debilitating illness that affects 16% of adults during their lifetime and approximately 80% of people with depression report that their symptoms interfere with their ability to work and be socially active. Many patients with depression are treated in the primary care setting yet the disease continues to go undiagnosed and undertreated; antidepressant compliance rates are low and patient follow-up is infrequent. Community pharmacists have the opportunity to identify undiagnosed patients and improve depression care by providing patient education and counseling. The purpose of this project is to develop, implement, and evaluate a pharmacist-conducted depression screening and education program in a multi-site grocery store pharmacy. The objectives of this study are to determine the ability of this screening to identify undiagnosed patients and to measure the effect of a pharmacist-conducted educational intervention on antidepressant medication adherence, symptom improvement, and patient satisfaction.

Methods: Patients who are currently enrolled in existing disease management programs and who present for a healthcare screening will be screened for depression by pharmacists using the Patient Health Questionnaire (PHQ). Patients with a current or previous diagnosis of mental illness and those currently on antidepressant therapy will be excluded from the study. Patients with a positive screening will be referred to their physician for further evaluation and a pharmacist will follow-up with these patients four weeks after the initial screening. Patients diagnosed with depression and started on an antidepressant will be offered a one time educational session with a pharmacist that will provide an overall review of the disease state and its treatments. The pharmacist will follow-up with the patient every four weeks for at least eight weeks to assess medication adherence, symptom improvement, and patient satisfaction.

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

Learning Objectives:

Discuss the barriers to successfully diagnosing and treating depression in the primary care setting.

List the advantages of using a validated tool to screen for depression in the outpatient setting.

Self Assessment Questions:

All of the following are barriers to successful diagnosis and treatment of depression in the primary care setting except:
a.Inadequate coordination and continuity of care between members of the healthcare team
b. Lack of patient education and follow-up
c. The negative stigma surrounding mental illness
d. All of the above

Which of the following self-reported screening tools was specifically developed to aid in the diagnosis of depression in the outpatient/primary care setting?
a. Beck Depression Inventory (BDI)
b. Patient Health Questionnaire (PHQ)
c. Hamilton Depression Rating Scale (HAM-D)
d. Montgomery-Asberg Depression Rating Scale (MADRS)

EVALUATION OF HEPARIN INDUCED THROMBOCYTOPENIA (HIT) GUIDELINE AT AN ACADEMIC MEDICAL CENTER

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Purpose: The diagnosis of HIT is complex and involves integrating both clinical and laboratory findings. Therefore, the decision to initiate direct thrombin inhibitor (DTI) therapy for HIT is challenging. A guideline incorporating the 4T pretest probability score, ELISA result, and optical density (OD) value was implemented to determine a patients candidacy for DTI therapy. The objective of this study was to evaluate the impact of a HIT guideline on appropriate DTI utilization.

Methods: Retrospective chart review was conducted of patients with a positive or equivocal ELISA result during a 2 year period. Each of these patients was evaluated for DTI therapy. Indication for DTI initiation includes a 4T score >3 and/or positive ELISA result with an OD ≥ 1 or the presence of an acute thrombosis. The primary endpoint was to evaluate the ability of the guideline to identify subjects with HIT confirmed by serotonin release assay (SRA) for DTI therapy. A cost avoidance analysis will also be performed.

Results/Conclusion: To date, 73 patients have been identified for inclusion in the study and 31 patients have been reviewed. The guideline identified 11 of these patients as candidates for DTI therapy, whereas 16 of them had received DTI therapy. Of those patients identified by the guideline as DTI candidates, 2 had negative SRA results. Conversely, one SRA positive patient was not identified by the guideline to receive DTI therapy. Considering the inappropriately categorized patient, 4 DTI treatment courses may have been avoided through implementation of this guideline. Preliminary data suggest a HIT guideline may be a tool to aid in the appropriate utilization of DTIs. Final study results will be available at the time of the GLRC and may identify areas for guideline improvement and clarify its utility at an academic medical center.

Learning Objectives:

Explain current approaches used to aid in the diagnosis of heparin induced thrombocytopenia.

Discuss the potential role of ELISA optical density values to better identify patients with serotonin release assay confirmed heparin induced thrombocytopenia.

Self Assessment Questions:

ELISA testing for anti-PF4/heparin IgG is associated with
-Low sensitivity and high specificity
-Low specificity and high sensitivity
-High sensitivity and high specificity

List the four components of the 4T pretest probability score.

THE EFFECTS OF INSULIN OR PIOGLITAZONE THERAPY IN TYPE 2 DIABETIC PATIENTS ON GLYCEMIC CONTROL, MACROVASCULAR COMPLICATIONS, AND MICROVASCULAR OUTCOMES

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Background:
Diabetes is a chronic disease state which can lead to various complications if not well controlled. The correlation between achievement of glycemic goals and a decrease in microvascular complications has been established by many clinical trials. However, the relationship between glycemic control and macrovascular complications has not been well defined. This study will evaluate the effects of therapy with insulin NPH or pioglitazone on glycemic control, microvascular complications, and macrovascular outcomes in the veteran population.

Purpose:
The primary objective of this study is to evaluate the efficacy of therapy with insulin or pioglitazone on hemoglobin A1c levels in veterans with type 2 diabetes. Secondary objectives will include determination of the incidence of macrovascular complications (myocardial infarction, stroke) and microvascular complications (retinopathy, albuminuria, worsening serum creatinine and estimated creatinine clearance) with either therapy. Other outcomes will include adverse effects, blood pressure, and lipid control.

Methods:
This retrospective review of veterans with type 2 diabetes will be conducted at the Chalmers P. Wylie Veterans Affairs Ambulatory Care Center in Columbus, Ohio. Patients with a hemoglobin A1c level of 7.5 to 9% who began therapy with insulin NPH or pioglitazone from November 1, 2007 through May 31, 2008 will be selected from a pharmacy computer database-generated list of patients. Eligible patients will be 18 years of age or older, will have had a hemoglobin A1c level measured within three months prior to therapy initiation, and will have had a hemoglobin A1c level measured at least three months post-therapy initiation. Patients will be excluded from the study if they have received prior therapy with any thiazolidinedione agent or with basal insulin (insulin NPH, insulin glargine, or insulin detemir).

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

Learning Objectives:

Discuss the relationship between glycemic control and the common microvascular and macrovascular complications associated with type 2 diabetes.

Identify the effects of therapy with insulin NPH or pioglitazone on glycemic control.

Self Assessment Questions:

T/F: According to the Diabetes Control and Complications Trial (DCCT), achievement of glycemic goals resulted in a reduction in both microvascular and macrovascular complications.

T/F: Patients who received therapy with NPH insulin had increased achievement of glycemic goals in comparison to patients who received therapy with pioglitazone.

COMPARISON OF CLEVIDIPINE WITH NICARDIPINE IN ACUTE BLOOD PRESSURE CONTROL AFTER ACUTE STROKE

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Background: Each year, approximately 795,000 people experience new or recurrent stroke. Both hypotension and hypertension is associated with increased risk of poor outcome and mortality for both intracranial hemorrhage (ICH) and acute ischemic stroke (AIS) with a U-shaped relationship. Thus, acute blood pressure (BP) management is vital during the acute phase of elevated BP in order to avoid hypo- or hypertension. Nicardipine has been shown to be safe and effective in treating in acute BP elevations associated with AIS and ICH. Clevidipine, the newest calcium channel blocker, can lower BP rapidly and has a rapid offset of effect which may be beneficial in patients needed tight BP control. Unlike nicardipine very little information or experience has been reported with clevidipine in the stroke population.

Purpose: The purpose of this study is to evaluate the comparative safety and effectiveness of nicardipine and clevidipine in patients treated for acute BP control following stroke.

Methods: This is an observational, case-control study. Patients at least 18 years old who received nicardipine and clevidipine during the study period with a confirmed diagnosis of AIS, ICH, or aneurysmal subarachnoid hemorrhage were included. Exclusion criteria are patients with neurologic disorder with non-stroke etiology. Patients who received clevidipine were prospectively identified by the pharmacy database (MedManager) from November 15, 2009 to present and patients who received nicardipine were identified by querying the pharmacy database for all nicardipine orders from January 1, 2007 - November 15, 2009. Electronic and written patient charts, as well as pharmacy records were reviewed for variables such as medical history, baseline characteristics, laboratory values, and BP measurements during the first 48 hours of the study drug infusion. The variables will be compared using Fishers Exact or Chi-Square test (categorical variables) and Wilcoxon Rank-Sum test (continuous variables) when appropriate.

Results and conclusions: Pending

Learning Objectives:

To describe the effectiveness of intravenous nicardipine compared with intravenous clevidipine in controlling acute blood pressure after acute stroke

To describe the incidence of adverse events following administration of intravenous nicardipine and intravenous clevidipine

Self Assessment Questions:

True or False: Clevidipine is a second generation dihydropyridine calcium channel blocker.

True or False: Clevidipine has been shown to be safe and effective in controlling blood pressure during the acute phase of stroke.

A COMPARISON OF CENTRALIZED AND DECENTRALIZED MEDICATION STORAGE ON NURSING UNITS

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BACKGROUND: One of the leading causes of adverse events in hospitalized patients is medication errors. As a result, institutions are designing safeguards to help decrease the potential for medication related errors. At Lutheran General Hospital, a decentralized nursing care model was developed for a newly constructed patient bed tower. The model includes the use of built-in nurse server units which are storage areas within the patient room. The servers contain clean linens, medical supplies and patient specific medications (in a locked drawer), as well as a dirty linen bin. This allows the majority of the required resources for patient care to be readily available at the patients bedside, optimizing nursing time spent with patients. The main hospital currently uses a centralized medication storage system. Unit dose medication carts are centralized in a medication room along with other medical supplies.

PURPOSE: To determine which medication storage model, centralized or decentralized, is the safest and most cost effective method.

METHODS: All patients on the surgical unit in the main hospital and the general surgery unit in the new bed tower will be included in the study. Medication error reports will be reviewed for each unit. Nursing time studies will also be conducted to determine the amount of time nurses spend on medication-related activities. This will involve both direct nursing observations as well as a self-reporting checklist. The primary outcome is to determine the effects of centralized and decentralized medication storage units on medication errors and time spent administering medications. The secondary outcome is to determine if decentralized nursing improves patient care by providing fewer interruptions for both nursing and pharmacy.

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

Learning Objectives:

Describe the various types of medication storage devices.

Identify the advantages and disadvantages of medication storage devices.

Self Assessment Questions:

What is a nurse server unit?

Which of the following is a potential advantage of a nurse server unit?
A. Nurses can spend more time communicating with each other
B. Majority of the resources for patient care are readily available at the patients bedside
C. Nurses can use a discharged patients medication for another patient if pharmacy is taking too long to deliver the medication
D. None of the above

THE USE OF TEAM-BASED LEARNING IN FAMILY MEDICINE RESIDENT DIDACTIC EDUCATION.

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Purpose:
Team-based learning (TBL) is an instructional strategy that is used to foster active learning within a large group setting. TBL has been correlated with increased learner engagement and preparedness, improved problem solving, better communication process and teamwork skills, and improved knowledge outcomes. The purpose of this study is to facilitate awareness of TBL in a family medicine resident setting and identify possible benefits and disadvantages to this form of learning.

Methods:
The study will consists of a pre-TBL article reading, two TBL sessions, and a two part data collection process. Part one of the data collection process will include collection of data using Individual Readiness Assessment Tests (IRATs), Group Readiness Assessment Tests (GRATs), and group case questions from the TBL session. This data will be submitted prior to the discussion of the answers during the TBL. The IRATs and GRATs will measure knowledge acquirement and differences between individual scores and group scores. The group case questions will measure application of knowledge. Part two of the data collection process involves two surveys that will be sent to all residents who gave consent for participation in the study. The first survey will be sent out directly after the TBL session. It will include questions about individual perceptions and attitudes regarding the TBL session in the categories of: relevancy, effectiveness, objectives, confidence in area, and cooperative learning. The second survey will be sent out one month after the completion of the TBL session and will measure retention of the knowledge acquired in the IRAT and GRAT.

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

Learning Objectives:

Define the concept of team based learning.

Identify the advantages and disadvantages of various teaching modalities.

Self Assessment Questions:

Which of the following best describes team-based learning?
A. Active
B. Passive
C. Traditional
D. None of the above

Which of the following is an advantage to lecture style learning?
A. Communication is one way
B. Active form of learning
C. Able to present information to many people at once
D. Can easily gauge degree of learning

JUSTIFYING CLINICAL PHARMACY SERVICES FOR A NEONATAL INTENSIVE CARE UNIT AT A PEDIATRIC INSTITUTION

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Purpose: Increasing acuity of the neonatal intensive care unit (NICU) population, coupled with a planned hospital expansion, has required evaluation of clinical pharmacy resources for the neonatal population. Currently, two clinical pharmacy full-time equivalents (FTEs) provide coverage for 101 licensed NICU beds with an average daily census of 90 patients.

Objective: The objective of this study is to qualify and quantify the amount clinical pharmacy resources necessary for a population growing in acuity and size.

Methods: This evaluation, conducted at Nationwide Childrens Hospital with Institutional Review Board approval, utilized retrospective and prospective data specific to the NICU population and current clinical pharmacy resources allocated to this patient care area. Specific data points included census trends, length of stay, birthweight information, nursing resources, drug levels, and dispensed monitorable medications. Information was collected utilizing the computerized order entry system, Patient Health Information System (PHIS) database, hospital data analysts, and the Vermont-Oxford Database. Time and motion studies were conducted by an internal consulting company, Business Process Improvement, to investigate the workflow of current neonatal clinical pharmacists. Finally, subjective comments from attending physicians were solicited to demonstrate the perceived value of clinical pharmacist services in the NICU.

Results: The results and conclusion of this study will be reported at the Great Lakes Pharmacy Resident Conference presentation in April 2010.

Learning Objectives:

Identify data that is important to collect to justify an additional clinical pharmacist in the neonatal intensive care unit.

Describe the role and responsibilities of a clinical pharmacist in the neonatal intensive care unit.

Self Assessment Questions:

True or False, diagnoses such as neonatal abstinence syndrome (NAS) constitute a small percentage of overall patients, but require significant clinical contribution and time commitment from clinical pharmacists in the neonatal intensive care unit?

True or False, PHIS data shows an increasing acuity of neonates in the Midwest.

COMPARISON OF INTRAVENOUS IMMUNOGLOBULIN AND PLASMAPHERESIS IN THE TREATMENT OF MYASTHENIA GRAVIS EXACERBATION

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Purpose
Myasthenia gravis (MG) is an autoimmune disease associated with double vision, drooping eyelids, slurred speech, difficulty chewing or swallowing or respiratory distress. During an exacerbation the primary treatment is intravenous immunoglobulin (IVIG) or plasmapheresis. The cost of a 5 day course of IVIG treatment for a 70 kg person is approximately 10,000 dollars. Due to the high cost of IVIG and its burden on the pharmacy budget, there is a need for an analysis of the cost associated with IVIG and plasmapheresis therapies. The primary objective is to compare the total cost of hospital therapy in patients receiving IVIG or plasmapheresis for the treatment of Myasthenia Gravis. Secondary objectives include comparison of the incidence of adverse events, length of hospital stay, and three versus five days of IVIG therapy.

Methods
This is a retrospective chart review of MG patients admitted to Indiana University Hospital from January 2007 to August 2009. To be included in the study, patients had to receive IVIG, plasmapheresis or both for the MG exacerbation. Data on IVIG dose, number of completed plasmapheresis cycles, length of stay, duration of intubation and adverse events will be extracted from patient medical charts. Included in the cost analysis is the total cost of the hospital stay, the costs attributed to pharmacotherapy, hospital room, diagnostics, procedures and other services.

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

Learning Objectives:

Explain the pathophysiology of Myasthenia Gravis.

Identify adverse events of IVIG and plasmapheresis.

Self Assessment Questions:

What is (are) the typical presenting symptom(s) of a myasthenia gravis exacerbation?
a.Double vision
b.Difficulty swallowing
c.Drooping eyelids
d.Slurred speech
e.all of the above

T/F: Previous studies comparing IVIG and plasmapheresis in myasthenia gravis showed that plasmapheresis is superior to IVIG.

IMPACT OF ENTEROCOCCAL PNA FISH ON ANTIMICROBIAL USE AT CLEVELAND CLINIC

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Purpose: Enterococcus is the third most common cause of bloodstream infections. Enterococcal peptide nucleic acid fluorescent in situ hybridization (PNA FISH) probes use molecular methods to allow more rapid identification of Enterococcus faecalis and other enterococci in blood cultures compared to traditional microbiology methods. The purpose of this study is to predict the impact of the implementation of enterococcal PNA FISH to determine if this would result in earlier initiation of targeted antimicrobial therapy and/or decrease in time to de-escalation of therapy. A secondary objective is a cost-benefit analysis.

Methods: This retrospective chart review includes 150 patients with blood cultures positive for enterococci from November 1, 2008 to October 31, 2009. Patients will be identified from a microbiology report. Patients included must be 18 years of age or older and have at least one blood culture positive for enterococci. Patients with death or discharge within 24 hours of positive blood cultures will be excluded. The following data will be collected: age, gender, primary service, admission and discharge dates, underlying medical conditions, source of infection, date and time of culture results, initial antimicrobial agent, time of initiation of therapy, start and stop dates of antimicrobials, reasons for changes in therapy and date of change. The primary outcomes of this study include: reduction in time to initiation of targeted therapy, earlier escalation of therapy, and earlier de-escalation of therapy. Data analysis will include descriptive statistics, t-test for continuous data and Fishers exact test or chi-square for nominal data. A cost benefit analysis will also be performed. This study has been approved by the Institutional Review Board.

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

Learning Objectives:

Discuss the epidemiology and treatment options for bloodstream infections due to enterococcal species

Describe the current microbiological testing methods for the detection of enterococcal species

Self Assessment Questions:

True/False - E. faecalis is more commonly resistant to vancomycin than E. faecium.

All of the following antimicrobials can be used for the treatment of infections caused by vancomycin-resistant E. faecium (VRE) EXCEPT:
a. Daptomycin
b. Linezolid
c. Vancomycin
d. Quinupristin/dalfopristin

SMOKING CESSATION IN A MANAGED CARE MEDICAID POPULATION

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Purpose: Tobacco use persists as a major public health concern, precipitating various medical conditions and subsequent mortality. Current guidelines place an increased emphasis on appropriate patient counseling in addition to medication therapy. The primary objective of this study is to determine the efficacy of tobacco cessation telecounseling utilizing guideline-defined methods with pharmacists and pharmacy students as primary clinicians.

Methods: Adult patients having filled a prescription for a Medicaid-covered smoking cessation medication were identified prospectively via a Medicaid database. Patients receiving pharmacotherapy during January and May 2009 were exempt from telecounseling and defined as a control group. Counseling methods include eight sessions over 12 months, each approximately 15 minutes, focused on medication education, coping techniques, review of motivation and encouragement, relapse prevention, and anticipated health benefits. Data collection includes patient demographics, nicotine dependence, smoking habits, and counseling duration. Primary outcomes include tobacco cessation rates after six counseling calls, six months after enrollment, and one year after enrollment. Six month tobacco cessation rates and nicotine dependence will be compared between active and control patient populations.

Results: Through November 2009, 179 patients were prospectively enrolled in the program. Preliminary data from 19 patients completing six counseling calls shows tobacco cessation rates of 53% (n = 10) with an average counseling duration of 85 +/- 34 minutes.

Conclusions: Further data collection and evaluation is currently in progress. Conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:

Describe appropriate tobacco cessation counseling methods based on U.S. Public Health Service guidelines.

Recognize the role of the pharmacist in tobacco cessation.

Self Assessment Questions:

True or False: Current guidelines do not support the use of tobacco cessation telecounseling when not under the direct supervision of a physician.

Which of the following is a potential side affect associated with the use of varenicline?
a.Nausea
b.Vivid dreams
c.Mood changes
d.All of the above

RETROSPECTIVE ANALYSIS OF THE EFFICACY OF ERYTHROPOIESIS-STIMULATING AGENTS (ESAS) IN THE TREATMENT OF ANEMIA FOLLOWING RENAL TRANSPLANTATION

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Purpose:
Anemia is a common phenomenon in renal transplant recipients. However, there is limited data on the evaluation and management of anemia in this patient population during the posttransplant period. While the efficacy of ESAs has been demonstrated in the treatment of anemia in chronic kidney disease patients, studies of ESAs in renal transplant recipients are lacking and inconsistent. From this data it cannot be determined if there is a clear benefit of ESA use in the treatment of anemia posttransplant. The purpose of this study is to evaluate the efficacy of ESAs in the management of anemia after renal transplantation, describe the current practice of ESA use in renal transplant recipients, and evaluate the safety of ESAs.

Methods:
The study design is a single-center, retrospective cohort study. The UC Transplant Database will be used to screen patients aged 18 years and older who have received a first-time renal transplant at The University Hospital from January 1, 2005 through December 31, 2008. Patients will be categorized based on hemoglobin values greater than or equal to 10 g/dL or less than 10 g/dL at seven days posttransplant. Patients will be further subdivided into those receiving ESAs posttransplant and those not receiving ESAs posttransplant. Primary outcomes include changes in hemoglobin values at various times posttransplant, the proportion of patients achieving hemoglobin values greater than or equal to 11 g/dL and 12 g/dL at 3 months posttransplant, the time in number of days to reach these hemoglobin targets, and the number of blood transfusions. Secondary outcomes include ESA dosages, appropriate therapy with iron, vitamin B12, folate, or multivitamins, cardiovascular events, and other safety endpoints.

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

Learning Objectives:

Identify potential risk factors for the development of posttransplant anemia.

Discuss the role of ESAs in the treatment of anemia after renal transplantation.

Self Assessment Questions:

Which of the following are potential risk factors for the development of posttransplant anemia?
A.Immunosuppressive medications
B.Delayed graft function
C.Early acute rejection
D.ACE inhibitors and ARBs
E.All of the above

True or False: ESA dosing should be individualized to maintain hemoglobin values within the range of 10 to 12 g/dL.

IMPACT OF TIME TO APPROPRIATE ANTIFUNGAL THERAPY AND TREATMENT-RELATED RISK FACTORS ON PATIENT OUTCOMES WITH CANDIDA BLOODSTREAM INFECTIONS

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PURPOSE: Prompt initiation of antimicrobial therapy is a well-known predictor of beneficial outcomes in bacteremia; however the impact of time to appropriate therapy in patients with fungemia has not been extensively evaluated. The goal of this study was to investigate the time to administration of appropriate antifungal therapy and its effect on in-hospital mortality. Additionally, treatment-related risk factors for mortality were identified.

METHODS: Retrospective cohort study including consecutive adult patients with a positive Candida blood culture from January 2004 to December 2009. Patients who were <18 years old, did not receive antifungal therapy, or received empiric antifungal therapy at time of culture were excluded. Time to appropriate therapy was calculated from time of first positive Candida culture collection to receipt of appropriate antifungal. A literature search for treatment-related risk factors was used to identify and later evaluate confounding variables for mortality. Selected treatment-related variables were administration of a loading dose, time to any antifungal agent and prompt catheter removal.

RESULTS: 100 patients have been evaluated. The most common species was C.albicans (47.4%), 71% of patients had concomitant bacterial infections, 35% had a history of malignancy, and overall time to appropriate therapy was 51.4 hours. There was no significant difference between time to appropriate therapy for those who lived (n=76) 44.5 hours, and died (n=24) 50.7 hours, p=0.834. No significant differences were found in treatment-related risk factors between those who lived and died. Factors significantly associated with mortality were patients who were admitted to an ICU (p<0.001), mechanically ventilated (p<0.001), and those who received TPN (p=0.048) at the time of the first positive Candida culture.

CONCLUSION: For adult patients with candidemia more rapid drug therapy and treatment-related risk factors did not influence outcomes. Severity of disease played a significant role in mortality.

Learning Objectives:

Identify appropriate antifungal regimens for Candida bloodstream infections.

List several risk factors for invasive Candida infections.

Self Assessment Questions:

The majority of candidemia infections are caused by:
A. C.albicans
B. C.glabrata
C. C.tropicalis
D. C.parapsilosis

Which of the following are not well-known risk factors for invasive candidiasis?
A. Broad-Spectrum Antimicrobials
B. Retained Central Venous Catheters
C. Enteral Nutrition
D. Neutropenia

CLASS III ANTIARRHYTHMIC EFFICACY IN A TERTIARY CARE CENTER AMBULATORY CARE CLINIC

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Purpose:
Class III antiarrhythmics are frequently prescribed for maintenance of sinus rhythm in patients with cardiac arrhythmias. Amiodarone and sotalol are both recommended by the ACC/AHA/ECS guidelines for the management for ventricular arrhythmias and atrial fibrillation. Dofetilide is recommended by the ACC/AHA/ECS guidelines for the management for atrial fibrillation.
Amiodarone, dofetilide, and sotalol have all been shown to be efficacious in prolonging time to recurrence of arrhythmia. To date there are no studies comparing the efficacy of these three class III antiarrhythmic agents in the outpatient setting. It is the intent of this study to determine the efficacy of class III antiarrhythmic agents in outpatients at a tertiary care center.

Methods:
A retrospective review was performed in outpatients with atrial or ventricular arrhythmias receiving class III antiarrhythmics (amiodarone, sotalol, and dofetilide) for maintenance of sinus rhythm who presented to an antiarrhythmic medications clinic between July 1, 2007 and November 15, 2009.
The primary endpoint was antiarrhythmic efficacy measured by time to recurrence of arrhythmia in patients on amiodarone, sotalol, and dofetilide. Secondary endpoints included: 1) efficacy of a second class III antiarrhythmic upon initial treatment failure, 2) reasons for discontinuation of antiarrhythmic drug other than arrhythmia recurrence (i.e. intolerable adverse events or toxicity), 3) association of patient response in relation to demographics and adherence.

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

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

Learning Objectives:

Describe the role of class III antiarrhythmics in maintenance of sinus rhythm in patients with ventricular and atrial arrhythmias.

List the most common side effects associated with class III antiarrhythmics.

Self Assessment Questions:

True/False: Sotalol is considered first line for maintenance of sinus rhythm in atrial fibrillation

Amiodarone is often discontinued due to which of the following adverse events:
a. GI intolerance
b. Hypothyroidism
c. Liver toxicity
d. Abnormal gait
e. All of the above

ANTIMICROBIAL DOSE REDUCTION BASED ON PHARMACOKINETIC AND PHARMACODYNAMIC PARAMETERS: FOCUS ON MEROPENEM, CEFEPIME, AND CIPROFLOXACIN

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Purpose: Traditionally, antimicrobial de-escalation is contained to spectrum reduction; however, dose reduction based on organism minimum inhibitory concentration (MIC) is a new method of achieving pharmacokinetic and pharmacodynamic targets without theoretically reducing clinical efficacy. Critically ill patients should be receiving aggressive initial dosing due to infection severity and altered pharmacokinetics. However, once organism MIC data is known, therapy can be tailored to achieve a high probability of target attainment. When MIC values are low, this means doses of antimicrobial agents can be reduced. This study will measure the efficacy of dose reduced antimicrobials in the treatment of infections in critically ill adults.

Methods: This retrospective review of patients admitted to the University of Wisconsin Hospital and Clinics 24 bed medical and surgical intensive care unit evaluated the efficacy of meropenem, cefepime, and ciprofloxacin before and after dose reduction protocol implementation. Patients will be included if they received at least 72 hours of antibiotics with any of the aforementioned antibiotics between February 1, 2009 to September 30, 2010. The first nine months will include patients who received conventional doses of antibiotics (meropenem 500mg IV every 6 hours extended infusion, cefepime 2 grams IV every 8 hours standard infusion, or ciprofloxacin 1200mg IV per day). The second nine months will include patients who received dose reduced antibiotics (meropenem 500mg IV every 8 hours extended infusion, cefepime 2 grams IV every 12 hours standard infusion, or ciprofloxacin 800 mg IV per day) after MIC results return. Primary outcomes include defined daily dose, number of patient ventilator days and ICU length of stay. Secondary outcomes include hospital length of stay and in-hospital mortality.

Conclusion: Data collection and evaluation are currently ongoing.

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

Learning Objectives:

Explain the use of pharmacokinetic/pharmacodynamic principles to support the dose reduction of antimicrobials to susceptible organisms

Name the MIC cut-off points used in the dose reduction protocol

Self Assessment Questions:

Name the optimal pharmacodynamic property (for predicting bacterial killing and microbiologic response) for the beta-lactam class and for the fluoroquinolone class.

What populations are excluded from the dose reduction protocol due to altered pharmacokinetic/pharmacodynamic principles?

COMPARATIVE-EFFECTIVENESS ANALYSIS OF VANCOMYCIN VERSUS LINEZOLID IN THE TREATMENT OF NOSOCOMIAL PNEUMONIA

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Several published reports claim higher survival and clinical cure rates with linezolid compared with vancomycin for the treatment of noscomial pneumonia (NP); however, the methodology and results of these analyses are highly controversial. Despite the higher acquisition cost of linezolid, three industry-sponsored analyses found linezolid to be a cost-effective alternative to vancomycin in the treatment of NP, albeit all assumed greater effectiveness of linezolid. This study examines the costs associated with the use of vancomycin compared with linezolid for treatment of NP with a particular emphasis on examining results assuming no therapeutic difference between agents.
We conducted a decision model analysis of linezolid versus vancomycin for treatment of NP. The decision analytic model was developed from a hospital perspective. Wholesaler acquisition cost (WAC) was utilized as the cost and a literature review was compiled to populate the model variables. Univariate sensitivity analyses assessed the impact of model uncertainties and robustness of our conclusions.
Our model indicated the cost per quality-adjusted life-year decreased 91% ($261 vs. $2,637) by utilizing vancomycin for NP. The incremental cost per quality-adjusted life-year for linezolid was $63,393. Our model predicted a cost-per life saved of $57,258.
We investigated the effects of rate of clinical cure in our secondary analysis. Our model indicates the cost per clinical cure of $358 for vancomycin and $3,702 for linezolid. The incremental cost per clinical cure by utilizing linezolid was estimated to be $221,875. Assuming a 3% benefit in linezolid clinical cure rate changes, the incremental cost per clinical cure is reduced to $59,167.
While linezolid may provide improved clinical survival and increased clinical cure rates in the treatment of nosocomial pneumonia; however the costs associated with increased benefit over vancomycin are significant. Results provide stakeholders important information when evaluating antimicrobial therapy for treatment of NP in todays cost-conscious health-care environment.

Learning Objectives:

Explain current literature regarding efficacy of linezolid and vancomycin in the treatment of nosocomial pneumonia.

Explain current literature regarding cost-effectiveness of linezolid and vancomycin in the treatment of nosocomial pneumonia.

Self Assessment Questions:

True or False: Nosocomial pneumonia is the leading cause of death among hospital acquired infections.

The most common cause of all nosocomial infections is:
a). Pseudomonas aeruginosa
b.) Acinetobacter species
c.) Staphylococcus aureus
d.) Escherichia coli

DAPTOMYCIN USAGE TRENDS IN THE HOME INFUSION SETTING

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PURPOSE: The objective of this study is to identify daptomycin usage trends in the home infusion setting. Daptomycin, approved by the Food and Drug Administration in 2003, is among the newer parenteral antibiotic agents used to treat gram-positive infections. Use of daptomycin is increasing in the home infusion setting secondary to vancomycin treatment failure and/or poor response, ease of daptomycin monitoring, and daptomycins safety profile. From 2006 to 2009, daptomycin expenditures for a multi-site national home infusion company have grown dramatically, reflecting usage increases exceeding 100% per year.

METHODS: This is a retrospective chart review of patients that received daptomycin from January 2009 to February 2010. Inclusion criteria: adult and pediatric patients of the Chicago, Illinois, area branch of a multi-site national home infusion company. Electronic chart data extraction and manual chart review will be used to collect the following data: patient demographics, infection site, pathogen, prescriber specialty, prior antibiotic exposure, renal function, creatine phosphokinase levels, daptomycin dosage, method of administration, length of therapy, clinical response, rehospitalization, and discharge status from home infusion care. Upon completion of data collection, statistical tests will be utilized to identify trends and/or variations in patient characteristics and response to therapy.

RESULTS/CONCLUSIONS: Data collection in progress. Preliminary data (n=36) reveal osteomyelitis (22%), post-operative infections (19%), and bacteremia (17%) account for the top three daptomycin diagnosis. Final results with conclusion will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Identify trends between treatment duration and daptomycin dosage regimens.

Describe unique antimicrobial treatment considerations in the home infusion setting.

Self Assessment Questions:

TRUE OR FALSE. Daptomycin is commonly used to treat pneumonia.

Important antimicrobial therapy pharmacist functions in the home infusion setting include:
A.Monitoring weekly labs that include creatine phosphokinase levels
B.Weekly communication with patients home nursing agency and physican
C.Obtaining medication profiles to determine if clinically significant drug interactions exist
D.Weekly monitoring of adverse drug reactions
E.All of the above

ASSESSING THE PERCENTAGE OF TIME SPENT ON PHARMACIST FUNCTIONS ACROSS THE AURORA HEALTH CARE SYSTEM

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Purpose: The pharmacy department at Aurora Health Care is in the process of transitioning from a collection of distinct regional entities to a single integrated, all-inclusive system department. At the same time, Aurora is implementing computerized physician order entry (CPOE) site by site to enhance patient safety and increase quality of care. CPOE is currently utilized in two hospitals, and plans exist for system-wide implementation within the coming years. Completion of a work sampling study to assess how pharmacists currently use their time will allow for strategic planning for the future of the department and standardization of services throughout the system. In addition, data collected will quantify the differences between CPOE and non-CPOE sites, helping to determine the efficiency and impact of CPOE in this early phase of implementation.

Methods: All inpatient staff pharmacists throughout the Aurora Health Care system were asked to wear pagers that signaled randomly at a rate of 6.4 times per hour to gain an understanding of current use of pharmacist time. The study was completed during all shifts at the electronic intensive care unit (eICU) as well as each of the thirteen inpatient facilities over the course of one week. Pharmacists were prompted to record their current work activity on a data collection form each time the pager signaled. Upon study completion, observations were recorded and analyzed. Emphasis was placed on quantifying differences in the percentage of time spent on work activities between CPOE and non-CPOE sites. Data were also used to plan for system-wide CPOE implementation as well as identify opportunities to improve use of pharmacist time by increasing cognitive functions.

Results/Conclusions: Data collection has been completed at thirteen inpatient hospital pharmacies and the eICU. Tabulation and analysis are in progress; results and conclusions will be presented at Great Lakes Residency Conference.

Learning Objectives:

Define work sampling and discuss its advantages and disadvantages.

Identify differences in pharmacist work activities between CPOE and non-CPOE sites, at a time early in the process of system-wide CPOE implementation at Aurora Health Care.

Self Assessment Questions:

What are three benefits associated with work sampling as a data collection method?

What activities (if any) have pharmacists been able to spend increased time on in CPOE hospitals relative to non-CPOE facilities?

POST VALVE ANTICOAGULATION GUIDELINE IMPLEMENTATION: ADHERENCE AND SAFETY

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Purpose: There is a wide variance in anticoagulation and antiplatelet regimens utilized by cardiothoracic surgeons following valve replacement. The variability in care stems from concerns regarding bleeding risk, patient follow up for warfarin monitoring and inconsistency among the three major anticoagulation guidelines following valve replacement. A Post Valve Anticoagulation Guideline was implemented in April 2009 to standardize therapy at our institution. The purpose of this study is to assess anticoagulation guideline adherence and to determine the safety of the guideline recommendations.

Methods: Institutional Review Board approval was granted. A congruent study will be performed to assess anticoagulation guideline adherence in the post valve replacement patient population at The Ohio State University Medical Center. The health systems electronic medical record and cardiothoracic specialty pharmacists will be used to identify patients who underwent valve replacement surgery. Data collection included adherence to guideline upon discharge; surgeon; risk factors for thromboembolism and bleeding; valve type/position; and reason for deviation from guideline recommendations. Safety will be determined based on follow up monitoring post procedure. Serial scripted phone calls will be utilized to assess safety, readmission rates and patient understanding regarding anticoagulation plan of care. Patients will be contacted at 1, 3, and 6 months post valve replacement. All patients surgically treated for valve replacement, from January 25, 2010 to May 15, 2010 will be screened and consented for inclusion in the study. Pregnant women, patients under the age of 18, patients greater than 89 years of age and incarcerated patients will be excluded.

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

Conclusions: The post valve anticoagulation guideline has been accepted and is being utilized by the cardiothoracic surgery group. Safety data has not been established at this point in time, data collection ongoing.

Learning Objectives:

Identify risks associated with anticoagulation and antiplatelet therapy following valve replacement surgery.

Discuss risk factors associated with complications of anticoagulation and antiplatelet therapy.

Self Assessment Questions:

The risk factors for bleeding include female, hypertension, anemia, cerebrovascular disease, alcoholism, diabetes and liver disease.

The risk factors associated with thromboembolism include atrial fibrillation, hypercoagulable state, left atrial enlargement, low ejection fraction.

EVALUATION OF ANTIBIOTIC EXPOSURE AS A RISK FACTOR FOR THE DEVELOPMENT OF CLOSTRIDIUM DIFFICILE INFECTION.

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Statement of Purpose
Clostridium difficile infection (CDI) is a unique institutional infection that occurs almost entirely in patients who have received previous antimicrobial treatment. Existing literature has identified specific antibiotics clearly associated with increasing patients risk of developing CDI. Exposure to multiple antibiotics and multiple classes of antibiotics has also been associated with an increased risk of developing CDI. The purpose of the study was to define if specific antibiotics and duration of exposure are associated with increased risk of CDI.
Statement of Methods
This study used a retrospective case control design. The case group patients were on inpatient surgical teams who developed a positive C. difficile toxin assay at least 48 hours after admission. The control group patients were on inpatient surgical teams who received a course of antibiotics defined as antibiotics received for greater than 48 hours, but did not have a positive C. difficile toxin assay documented. The groups were matched for age and length of stay (matched to the hospital day when case patients tested C. difficile toxin positive.)
Summary of Results
This study found the following results for the six most commonly used antibiotics as related to drug exposure in cases (%) and controls(%) respectively: piperacillin/tazobactam 60.9/ 39.1, cefazolin 50/ 49.2, levofloxacin 17.2/ 18.8, tobramycin 15.6/ 9.4, linezolid 18.8/ 10.9, and vancomycin 51.6/ 35. The results of this study found that approximately 62% of cases and 39% of controls were exposed to three or more antibiotics and approximately 61% of cases and 45% of controls were exposed to three or more classes of antibiotics. Case patients had significantly lower serum albumin than control patients supporting data that have identified low serum albumin as a risk factor.
Conclusions Reached
Conclusions are pending completion of statistical analysis.

Learning Objectives:

Discuss the association with antibiotic exposure and development of Clostridium difficile infection.

Describe other risk factors associated with developing Clostridium difficile infection.

Self Assessment Questions:

Which of the following antibiotics historically has NOT been associated with Clostridium difficile infection?
a.Clindamycin
b.Fluoroquinolones
c.Linezolid
d.Ceftriaxone

Which of the following statements is TRUE?
a.Exposure to multiple antibiotics appears to decrease incidence of CDI
b.Low serum albumin has been identified as a risk factor for the development of CDI
c.Exposure to multiple antibiotic classes appears to decrease incidence of CDI
d.Conflicting data exists on the association between anti-secretory medications and CDI

PERCEPTIONS OF EMPLOYER GROUPS TOWARD A COMMUNITY PHARMACY-BASED WELLNESS PROGRAM

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Pharmacist-managed patient care services such as health screenings, healthy lifestyle counseling, and medication therapy management have been shown to help reduce healthcare costs and improve disease state management. Since employer groups provide health insurance for the majority of individuals, they can incur greater healthcare costs than the patients themselves. In order to reduce these expenses, many of the employer groups are now looking into providing worksite wellness programs for their employees. Community pharmacists are in an advantageous position to provide wellness programs to individuals.
Purpose: To determine employers' perceptions of a community pharmacy-based wellness program for their employees and to gain an in-depth understanding of employers' views about their employees health and the types of health screenings they perceive as valuable to provide to their employees.
Methods: Employer groups who collaborate with a grocery chain pharmacy to provide flu shots for their employees will be contacted to participate in this prospective, survey-based study. They will be contacted either via telephone or email to introduce the idea of a community pharmacy-based wellness program for their employees. A survey will then be distributed to key decision-makers of each employer group via mail. A self-addressed return envelope will accompany the survey without senders information in order to maintain anonymity. Reminders will be sent to enhance participation in the research. The survey responses will be used to evaluate employers perceptions about pharmacist-managed wellness program and their views about their employees health. All completed, anonymous surveys will be collected and reviewed by the principal investigator.
Results: Data collection is currently in progress. Results will be presented at the Great Lakes Pharmacy Resident Conference.
Conclusion: The results of this study will determine the future direction and implementation of a community pharmacy-based wellness program, including development of collaborative agreements with employers.

Learning Objectives:

Explain the role of community pharmacists in providing wellness programs to employer groups in order to reduce their health care costs and improve their employees disease state management.

Discuss the perceptions of employer groups toward a community pharmacy-based wellness program for their employees to maintain a healthy workforce and business vitality.

Self Assessment Questions:

Which of the following patient care services can be provided to individuals through a community pharmacy-based wellness program?
a. Health Screenings (ex: cholesterol screening)
b. Healthy Lifestyle Counseling (ex: smoking cessation)
c. Immunizations (ex: Zostavax vaccination)
d. All of the above

Which of the following factors do not contribute to rising healthcare costs?
a. Chronic Diseases
b. Health insurance premiums
c. Medication Compliance
d. Lifestyle behaviors

EVALUATION OF INTRAVENOUS HEPARIN PROTOCOL ADHERENCE ON ACHIEVEMENT OF THERAPEUTIC GOAL IN A VETERAN POPULATION

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Background: Intravenous (IV) unfractionated heparin (UFH) is the anticoagulant therapy of choice to treat patients hospitalized for acute and potentially life-threatening disease states, such as suspected acute coronary syndrome and venous thromboembolism. Studies have shown that weight-based IV UFH dosing results in improved clinical and safety outcomes by achieving therapeutic activated partial thromboplastin times (aPTTs) significantly faster than non-weight-based dosing without resulting in increased bleeding complications. Currently, the Jesse Brown VA Medical Center (JBVAMC) utilizes two main weight-based IV UFH dosing protocols, designated as high- and low-medium intensity.

Purpose: The purpose of this study was to determine the effect of initial IV UFH protocol adherence on achievement of therapeutic aPTTs within 24 hours. The study also focused on the time to achieve therapeutic aPTT, the infusion rates at which therapeutic aPTTs were achieved, administration of initial IV UFH boluses, and adverse events.

Methods: This study was a retrospective, electronic chart review of JBVAMC veteran patients who were at least 18 years old and initiated on IV UFH between January 1, 2009 and August 31, 2009 to achieve the standard aPTT goals per protocol of 48-66 seconds and 62-97 seconds, respectively. Exclusion criteria included patients who did not meet the inclusion criteria, IV UFH therapy duration less than six hours, lack of clear documentation through bar code medication administration logs or other electronic charting sources, use of direct thrombin inhibitors within 24 hours prior to IV UFH initiation, and history of heparin-induced thrombocytopenia or lupus anticoagulant. aPTTs were recorded for patients for up to 36 hours after IV UFH initiation. Patient charts were reviewed for 14 days after IV UFH initiation to evaluate for adverse events.

Results/Conclusions: Data collection and analysis are ongoing. Final results with conclusions will be presented at the Great Lakes Pharmacy Conference.

Learning Objectives:

Identify the initial IV UFH dosing recommendations provided by the 2008 CHEST Guidelines for treatment of venous thromboembolism.

Discuss the importance of laboratory parameters used for therapeutic drug monitoring of IV UFH to achieve appropriate clinical outcomes and minimize potential complications.

Self Assessment Questions:

Per the 2008 CHEST Guidelines, the initial IV UFH dosing recommendation for treatment of pulmonary embolism is different than for treatment of acute coronary syndromes.

Close therapeutic drug monitoring is not required for use of IV UFH as it is not considered a high alert medication.

COMPARISON OF VANCOMYCIN TO METRONIDAZOLE FOR THE TREATMENT OF CLOSTRIDIUM DIFFICILE.

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Purpose: The severity of Clostridium difficile-associated disease (CDAD) can range from uncomplicated diarrhea to sepsis or even death. Antimicrobial use is strongly linked to the development of CDAD because it destroys the normal flora of the gastrointestinal tract, allowing for the overgrowth of C.difficile.1 Since 2000 there has been a notable rise in the number and severity of C. difficile infections accompanied by an increase in metronidazole failure.

Methods: An observational retrospective chart review of all patients at least 18 years or older with a positive C. difficile toxin, diarrhea (>3 unformed stools in 24 hours), and at least one of the following: fever (>38.3C), abdominal pain and/or leukocytosis. Patients with an intolerance to metronidazole or vancomycin, pregnant, colostomy; or diagnosis of ulcerative colitis, Crohns disease, short bowel syndrome, bowel obstruction or death within twenty-four hours after positive C. difficile toxin will be excluded. The following data will be collected: age, gender, place of residence, past medical history; dose, route and frequency of treatment antibiotic; days to symptom resolution, treatment in the intensive care unit, prior antibiotics, day prior antibiotics were discontinued; antiperistaltic medications, bile acid sequestrants and probiotics received during treatment period. Severe C. difficile is defined as any of the following: septic shock, megacolon, perforation, colectomy or pseudomembranous colitis. Chart review data will be entered and analyzed in Microsoft Access. Descriptive data analysis will include assessment of demographic data, initial study treatment, changes in study treatment, comorbid conditions, prior antibiotics, day prior antibiotics discontinued, days to symptom resolution and other ancillary medications used during treatment including: antiperistaltic medications, bile acid sequestrants and probiotics.

Results and Conclusions: Results will be presented at the residency conference.

Learning Objectives:

Explain the etiology behind the changing incidence and severity of Clostridium difficile colitis in the United States.

Describe the challenges of treating Clostridium difficile colitis today.

Self Assessment Questions:

Which of the following has been linked to the increase in incidence and severity of Clostridium difficile colitis:
A.The aging American population
B.Increase use of gastric acid suppressive therapies
C.Emergence of the BI/NAP1/027 strain

Which of the following is a challenge of treating Clostridium difficile colitis today:
A.Increasing resistance of Clostridium difficile to current treatment regimens
B.Increase in recurrence
C.Toxicity of current treatment modalities

EFFECT OF THE ADDITION OF AN AMBULATORY CARE PHARMACIST TO THE COMPUTERIZED PRESCRIBER ORDER ENTRY (CPOE) PROVIDER TRAINING TEAM ON ERROR RATES.

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Background
Computerized physician order entry (CPOE), has been shown in multiple studies in countries throughout the world to decrease prescription errors. However, CPOE also generates new and unique errors. Many of theses errors become pharmacys responsibility to catch and correct. This results in decreases in efficiency for both prescribers and dispensing pharmacies and increases the chance a dispensing error. There is little to no data on decreasing CPOE generated errors.

Purpose
The purpose of this study is to identify the most common prescription errors generated with CPOE at one ambulatory care pharmacy and identify the prescribing department that has the highest error rate. Additionally the purpose is to assess the effects on CPOE errors after an ambulatory care pharmacist joins the CPOE training team and focuses all interventions on one department.

Methods
For one month CPOE generated prescriptions with errors will be copied, compiled, and analyzed. At the same time the ambulatory care pharmacy resident will attend the Medication List and its Divisions Work Team (MLDWT) meetings to gain prescriber perspectives regarding difficulty with the CPOE. Results of the error collection will be presented to the MLDWT where they will work together to create a training/re-training plan. This plan will be implemented in the prescribing department with the most errors. CPOE generated prescriptions with errors will again be collected for one month. Error rates will then be compared both to other departments and with the previous samplings to detect the impact of the intervention.

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

Learning Objectives:

Identify common errors generated with CPOE and discus how those errors are produced

Describe interventions ambulatory care pharmacists can use to decrease errors generated with CPOE

Self Assessment Questions:

List the most common errors that occur with CPOE generated prescriptions seen in ambulatory care pharmacies.

List three factors that encourage prescriber errors when using CPOE.

REPEAT DEPRESSION SCREENING OUTCOMES IN AN OUTPATIENT HIV CLINIC

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Purpose: Depression has an estimated prevalence of 37% amongst HIV-positive patients. Primary care guidelines for the management of persons infected with HIV recommend evaluation for depression in all patients, as well as the development and implementation of a care plan to address these problems with a multidisciplinary medical team. Previously, a standardized depression screen and treatment algorithm was initiated in the Indiana University Medical Center outpatient infectious disease (ID) clinic conforming to these guidelines. Continued screening efforts are needed to identify affected patients and improve patient care within this clinic. The objective of this study is to evaluate the change in Patient Health Questionaire-9 (PHQ-9) score over time and determine the effectiveness of medications and psychosocial therapy in this patient population.

Methods: Depression screening in the ID clinic includes depression evaluation utilizing the PHQ-9. Once completed by the patient, the PHQ-9 is assessed by the clinician and identified patients referred to the pharmacist for education and initiation of treatment based on the depression treatment algorithm. Upon subsequent clinic visits, patients complete a PHQ-9 which is reviewed for objective assessment of treatment efficacy. A retrospective chart review of patients attending this clinic was conducted from June 2008 to January 2010. All patients completing a PHQ-9 screen were included, with the exception of pregnant females, patients less than 18 years of age, and prisoners. Data collected and analyzed includes age, gender, educational level, socioeconomic status, time since HIV diagnosis, CD4 count, viral load (VL), alcohol use, tobacco use, recreational drug use, psychiatric history, current and/or previous PHQ-9 score, current or newly initiated antidepressant medications, psychosocial therapy, time between follow-up visits after antidepressant initiation, as well as current and/or previous antiretroviral regimens.

Results/Conclusions: To be presented pending completion of data collection.

Learning Objectives:

Explain the utility of the Patient Health Questionnaire-9 and the scoring process.

Identify appropriate treatment based on the depression treatment algorithm.

Self Assessment Questions:

What severity of depressive symptoms would a score of 18 on the PHQ-9 indicate?
a. Mild or minimal
b. Moderate
c. Moderately severe
d. Severe

Based on the treatment algorithm, what actions would be taken based on a score of 18 on the PHQ-9?
a. Watchful waiting
b. Offer patient anti-depressants and/ or therapy
c. Start anti-depressant
d. Hospitalize patient

EXAMINING THE COST SAVING POTENTIAL OF INJECTABLE PRODUCTS BEING PREPARED AND DISTRIBUTED FROM THE AURORA PACKAGING CENTER

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Purpose: With the increasing cost of health care it is prudent to look into cost saving measures. Currently, Aurora Health Care is operating a packaging center out of St. Lukes Hospital that packages oral dosage units supplied to the 11 other hospitals within Auroras system. Packaging oral medications from a central location allows for bulk purchasing and a more efficient supply chain. This project examines the feasibility of expanding the packaging center model to injectable products prepared centrally and distributed throughout the system.

Methods: Analysis is being done of usage and purchasing data within Aurora Health Care to find which injectable products could be purchased and prepared less expensively from a central location. This analysis takes into account the different ways all system hospitals use the products available. Additionally, the physiological properties of the drug are investigated to determine if they can be prepared and shipped to other hospitals. Based on which drugs would best suit the objectives of this project it is anticipated that a trial run will be performed so that data can be collected to analyze the effectiveness of this approach.

Results/Conclusions: Data collection and analysis is currently being done and will be presented at the Great Lakes Conference.

Learning Objectives:

Understand what drug stability issues need to be addressed when preparing intravenous medications centrally and distributing to other hospitals.

Identify where potential cost-saving opportunities may exist with the variety of intravenous medication forms available through Auroras wholesale suppliers.

Self Assessment Questions:

Intravenous medications prepared in a USP-797 compliant clean room can be distributed to remote hospital sites for administration as long as the integrity of the product is not compromised and the expiration date given to the product has not been reached. True or False.

It is always better to prepare medications from bulk vials if a significant cost-savings can be achieved over the pre-mixed product. True or False.

IMPLEMENTATION AND ASSESSMENT OF A DIABETES EDUCATION CURRICULUM FOR PUBLIC SCHOOL FACULTY AND STAFF SUPERVISING STUDENTS WITH DIABETES

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The New Albany Floyd County school system has 26 students currently enrolled with type 1 diabetes. Public school faculty and staff (i.e. teachers, administrators, coaches, cafeteria personnel, etc) lack the education and necessary support to properly care for students with diabetes. Ultimately, the lack of disease state knowledge within the public school system as well as the high workload incurred by school nurses may result in poor disease control and potentially negative effects on psychosocial factors in these children. The diabetes education curriculum was developed and provided by licensed pharmacists at the Mathes Diabetes Center in collaboration with a New Albany Floyd County school nurse and presented in multiple sessions to faculty and staff. The education consisted of a single, 60-minute "Level 1" session provided for administration, health aides, coaching staff, and food service personnel, while a series of two, 90-minute "Level 2" sessions were provided for teachers with students with diabetes in their classroom. Participants completed assessments of diabetes disease state knowledge and confidence both before and after completion of the curriculum. Parents of students with diabetes within the New Albany Floyd County school system were asked to complete a questionnaire to assess their confidence in the schools ability to care for their child. Provision and assessment of the diabetes education is currently in progress and results are pending.

Learning Objectives:

Identify the current recommendations by the National Association of School Nurses (NASN) for nurses student responsibilities.

Discuss the current workload incurred by nurses within the New Albany Floyd County school system.

Self Assessment Questions:

The NASN recommended ratio of nurses to students is not to exceed:

A. 1:50
B. 1:750
C. 1:2000

True or false? A school nurse in the New Albany Floyd County school system has a student ratio within the recommendations of the NASN.

EFFECT OF DAILY VITAMIN D SUPPLEMENTATION ON HEMOGLOBIN A1C IN PATIENTS WITH UNCONTROLLED TYPE 2 DIABETES MELLITUS

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Purpose: Vitamin D is typically understood to support musculoskeletal health when administered concomitantly with calcium. A number of recent studies suggest, however, that this important nutrient may play a significant role in several pathophysiological processes, including diabetes mellitus. While clinical trials examining the effects of vitamin D in diabetes have been completed, most are of insufficient duration or power to detect a clinical effect.

Methods: In this prospective, single blind study, patients between the ages of 21 and 75 years with uncontrolled type 2 diabetes mellitus (defined as a hemoglobin A1c >7%) were randomized to receive either vitamin D3 2,000 IU daily or vitamin C 500mg daily. Patients with renal insufficiency (defined as a creatinine clearance <30mL/min), gestational diabetes, malabsorption syndrome or treated with high dose (>400IU daily) vitamin D in the previous year were excluded from the study. Follow up occurred at weeks 4 and 8 via telephone calls to assess adverse events. Hemoglobin A1c was measured at baseline and after 12 weeks of treatment.

Results and Conclusion: Enrollment to date is 37 of an anticipated 40 patients. Data collection and statistical analysis will be completed by April 2010.

ClinicalTrials.gov Identifier: NCT00985361

Learning Objectives:

Describe the non-skeletal benefits of adequate vitamin D stores.

Outline current evidence of the benefit of vitamin D supplementation in uncontrolled type 2 diabetes mellitus

Self Assessment Questions:

True of False: Hypovitaminosis D occurs in less than 20% of American adults and adolescents.

The most potent sources of natural vitamin D are
a.sunlight exposure, red meat and eggs
b.sunlight exposure, oily fish and mushrooms
c.oily fish, bananas and mushrooms
d.sunlight exposure, red meat and bananas

IDENTIFYING AND IMPLEMENTING MEASURABLE STRATEGIES TO INCREASE DISCHARGE PRESCRIPTION CAPTURE RATE AT A HOSPITAL OPERATED OUTPATIENT PHARMACY

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PURPOSE: To study barriers to a high discharge prescription capture rate and develop and implement strategies to overcome these barriers in a measurable and sustainable manner.

METHODS: The discharge prescription capture rate will be defined as the ratio of patients discharged from the hospital who have prescriptions filled at the Outpatient Pharmacy (OPP) to the number of patients discharged from the hospital. A formal analysis of discharge capture rate has not been performed to date. The current UWHC ambulatory pharmacies capture rate as calculated by prescription claims processing data is 15% based and is assumed to be similar to the discharge prescription capture rate. This rate will be calculated on a daily basis for one week before and after the implementation of strategies targeted to overcome barriers to OPP use.

Barriers to use of the OPP will be assessed by 1) meeting with groups of decentral pharmacy staff to assess perceived barriers, 2) conducting an online survey distributed to nurses, pharmacists, discharge planners, social workers, and physicians, and 3) analyzing the results of a customer satisfaction survey distributed to patients who had visited the OPP. Data collected will be organized and identified barriers will be presented to a project task force comprised of OPP pharmacy staff, decentral pharmacy staff, and pharmacy management to prioritize problems and develop strategies to overcome these barriers. Strategies developed by the task force will be implemented on a pilot basis on select units in the hospital.

PRELIMINARY RESULTS: Perceived barriers include difficulties obtaining prescription insurance information, concerns with promoting the use of multiple pharmacies, prescriptions being lost in transit to the OPP, and prolonged wait times.

CONCLUSION: To be presented.

Learning Objectives:

Identify barriers to outpatient pharmacy use by patients being discharged from the hospital

Describe changes implemented to overcome barriers to outpatient pharmacy use

Self Assessment Questions:

True or False: One barrier to utilizing the hospital based outpatient pharmacy was prolonged wait times.

True or False: Perceived barriers to outpatient pharmacy use were collected from nurses, pharmacists, discharge planners, social workers, and physicians.

FORMALIZATION OF AN ANTIMICROBIAL STEWARDSHIP PROGRAM THROUGH THE DEVELOPMENT OF DEDICATED PHARMACY SERVICES

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Purpose:
Antimicrobial stewardship programs (ASP) encompass a comprehensive approach to control the utilization of antimicrobials. An organized ASP involves selecting the appropriate drug and optimizing the dose, duration, and route of administration to minimize toxicities, control resistance, and reduce length of stay and health care costs. Pharmacists can be an integral part of an antimicrobial stewardship team to develop and implement strategies for safe and effective antimicrobial use.

Evidence-based strategies for promoting an ASP are (1) formulary restriction and pre-authorization and (2) prospective audit with intervention and feedback. Froedtert Hospital, a 500 bed hospital in Milwaukee, Wisconsin, is in the process of developing a formal ASP. Implementing a strategy and formalizing dedicated pharmacy services will enhance an ASP in Froedtert Hospital.

Methods:
The Infectious Disease Society of America (IDSA) guidelines were reviewed along with ASPs from other inpatient institutions. Baseline data of Froedtert Hospital guideline adherence included patients on linezolid and daptomycin for approved indications. Antibiotic stop dates included piperacillin/tazobactam, imipenem/cilastatin, and linezolid for greater than 10 days excluding patients with meningitis, osteomyelitis, endocarditis, cystic fibrosis, or neutropenic fever. Pilot initiatives will include an automatic stop date order form for broad-spectrum agents and disease states as well as education of pharmacy staff and workflow development.

Summary of Preliminary Results:
Data from 20 patients on linezolid and 27 patients on daptomycin were included. Baseline data demonstrated guideline adherence for daptomycin and linezolid use was 40% and 75%, respectively. Data for piperacillin/tazobactam, imipenem/cilastatin, and linezolid was gathered from 44, 44, and 20 patients, respectively. Inappropriate antibiotic use over 10 days occurred 38% with piperacillin/tazobactam, 65% with linezolid, and 18% with imipenem/cilastatin. Financial impact and progress to date will be presented.

Learning Objectives:

Describe the evidence-based core strategies for implementing an antimicrobial stewardship program.

Describe the financial impact of an ASP.

Self Assessment Questions:

List two evidence-based core strategies for implementing a successful ASP.

True/False There is a significant cost savings associated with a successful ASP.

PATIENT OUTCOMES FOLLOWING RAPID SEQUENCE INTUBATION (RSI): ETOMIDATE VERSUS OTHER AGENTS IN SEPTIC SHOCK

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Purpose:
The purpose of this study is to evaluate if morbidity and mortality are increased when etomidate is used for rapid sequence intubation (RSI) when compared to other induction agents in patients with septic shock.

Methods:
This is a retrospective study evaluating patients from Methodist and Indiana University hospitals. To be included in the study, patients had to be at least eighteen years of age; a patient between August 1, 2007 and August 1, 2009; had a diagnosis of septic shock, and received etomidate, vecuronium, rocuronium, or succinylcholine within twenty-four hours of a ventilator charge. The exclusion criteria were any patient who received the specified sedative/hypnotic for an indication other than rapid sequence intubation as well as all patients who were not in septic shock at the time of intubation. The primary objective was to evaluate if a difference existed in vasopressor use within seventy-two hours of rapid sequence intubation for patients who received etomidate versus another agent. A secondary objective evaluated if a mortality difference existed in the seventy-two hours following RSI among the different intubation sedative/hypnotics. Extubation rates were compared between patients who received etomidate for RSI or another agent. Other data collected included: demographic data, dose of the induction agent used, laboratory values at the time nearest to RSI, and the use of corticosteroids.

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

Learning Objectives:

Describe the clinical debate regarding etomidate versus another agent for rapid sequence intubation.

Recognize signs and symptoms of adrenal insufficiency.

Self Assessment Questions:

Adrenal insufficiency can result in all of the following complications, except:
a.hypotension
b.hypernatremia
c.hypoglycemia
d.hypovolemia

What is the time range in which etomidate effects can clinically be seen?
a.1 hour to 2 hours
b.24 hours
c.24 hours to 48 hours
d.48 hours to 72 hours

FREQUENCY AND SEVERITY OF DRUG-DRUG INTERACTIONS IN HOSPITALIZED PATIENTS RECEIVING HIGHLY ACTIVE ANTI-RETROVIRAL THERAPY

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Purpose
As HIV-infected patients are living longer, they are being diagnosed with more non-AIDS diseases requiring increased medication use. This creates a greater need for consideration of interactions between highly-active anti-retroviral therapy (HAART) and co-administered medications. The purpose of this study was to quantify the frequency with which patients admitted to the University of Illinois Medical Center at Chicago receive medications that are known to interact with their HAART regimen, and to assess the severity of interactions encountered.

Methods
A retrospective chart review of the 100 most recently admitted patients who were prescribed inpatient HAART between 01 September 2004 and 01 September 2009 was conducted. HIV-positive subjects aged 18 years and older who received HAART during time of admission were included. Medications prescribed during admission were determined by reviewing automatically generated lists of active medication orders embedded in daily progress notes. Drug-drug interactions (DDIs) were identified and stratified per level of severity using three Internet HAART drug interaction databases. These databases are generated by Toronto General Hospital (Canada), the University of California, San Francisco (HIV InSite, USA) and the University of Liverpool (United Kingdom). Pending completion of data collection, descriptive statistical analysis will be applied to assess the frequency and severity of drug interactions.

Results
Of the 100 charts surveyed, 84 included evaluable medication lists. Of those 84 patients, 48 (57.1%) were female and 60 (71.4%) were African American. The average patient age was 45.611 years, and the average length of hospital admission was 7.8 days. An average of 3.6 HAART agents were prescribed per patient. Tenofovir was the most frequently prescribed HAART agent, which appeared on 52 of the 84 evaluable medication lists (62%). Final results and conclusions are currently pending and will be presented in full at the 2010 Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Describe the growing problem of drug-drug interactions when highly active antiretroviral therapy is co-administered with other medications.

Recognize frequently encountered drug-drug interactions involving HAART.

Self Assessment Questions:

True/False: Medication use for management of non-AIDS diseases has increased among HIV-infected patients.

Treatment of which of the following disease states often requires the use of medications that interact with HAART?
A.Tuberculosis
B.Hyperlipidemia
C.Fungal infections
D.GERD
E.All of the above

RETROSPECTIVE EVALUATION OF EMPIRIC ANTIBIOTIC SELECTION IN PATIENTS AT RISK FOR HEALTH-CARE ASSOCIATED PNEUMONIA IN A PEDIATRIC EMERGENCY DEPARTMENT

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INTRODUCTION

Risk for health care-associated pneumonia (HCAP) is well-documented in adults with recent or ongoing contact with a health-care system, and the American Thoracic Society and Infectious Diseases Society of America have developed guidelines for appropriate management. Less data is available concerning risk and management of HCAP in pediatric patients. Anecdotal observations suggest that pediatric patients with similar risk factors may not be consistently identified upon presentation to the emergency department (ED) and may be receiving less optimal empiric antibiotic therapy. The primary objective is to determine the incidence of appropriate empiric antibiotic therapy in pediatric patients at risk for HCAP. The secondary objectives are to measure time from ED admission to start of appropriate culture-directed antibiotic therapy and describe the association of empiric HCAP antibiotic regimens with hospital length of stay.

METHODS

Retrospective chart review of patients admitted in 2009 to non-intensive care wards following evaluation in the ED at Nationwide Childrens Hospital for pneumonia. Inclusion criteria: 1.) Primary or secondary diagnosis of pneumonia or respiratory infection such as tracheitis, and 2.) residence in a long term care facility or recent admission to an acute care hospital for 2 or more days within the previous 90 days. Exclusion criteria: Direct admission to an intensive care unit and diagnosis of cystic fibrosis. Data collected includes: age, sex, initial respiratory tract culture after ED presentation, culture susceptibilities, empiric antibiotic choice, secondary antibiotics, length of stay, incidence of transfer to an intensive care unit, and co-morbidities. Time from ED admission to start of appropriate culture-directed antibiotic therapy and incidence of appropriate HCAP antibiotic therapy initiated in the ED will be recorded.

RESULTS

To be presented at the Great Lakes Residency Conference.

Learning Objectives:

Recognize pediatric patients at risk for health-care associated pneumonia (HCAP).

Identify an appropriate empiric antibiotic regimen in pediatric patients at risk for HCAP.

Self Assessment Questions:

T or F. A patient being admitted with suspected pneumonia with a previous admission to the ICU 6 months ago is at risk for HCAP.

T or F. The use of a beta-lactam antibiotic plus a macrolide is an appropriate empiric antibiotic regimen for patients at risk for HCAP.

OUTCOMES FOLLOWING TOTAL-KNEE ARTHROPLASTY (TKA) IN PATIENTS RECEIVING ENOXAPARIN VERSUS ALTERNATIVE ANTICOAGULATION POST-OPERATIVELY

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Purpose: It is well documented that bleeding rates differ between various forms of thromboprophylaxis following total knee arthroplasty (TKA). More specifically, low-molecular weight heparin (LMWH) therapy, such as enoxaparin, has been shown to produce higher bleeding rates than other forms of thromboprophylaxis including aspirin and warfarin. As a result of the increased bleeding rate and subsequent risk of hemarthrosis, orthopedic surgeons often avoid using enoxaparin in patients undergoing TKA. What is currently unknown is how the anticoagulant agent given post-operatively affects clinical course, functional outcomes, and quality of life in patients following TKA. The objectives of this study will be to determine whether patients given enoxaparin post-operatively after TKA have poorer clinical outcomes than those prescribed other anticoagulants.

Methods: Data will be collected retrospectively on patients who underwent TKA by 4 surgeons at St. Joseph Mercy Hospital since 2007 using information from the hospitals Quality Institute. Patients started on enoxaparin post-operatively will be compared with patients given other anticoagulants on measures of knee function including range of motion, pain score, and Knee Society Score, as well as on measures of general health through the use of SF36 (physical and mental composites) for all post-operative visits for 8 weeks after surgery. Additional information including age, gender, body-mass index (BMI), and co-morbidities will be obtained to determine if predictors of negative outcomes exist, irrespective of method of thromboprophylaxis used. Differences in rates of deep-vein thrombosis (DVT) and pulmonary embolism (PE) between anticoagulants will also be determined.

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

Learning Objectives:

Explain the current controversy that exists between the CHEST guideline and American Academy of Orthopedic Surgeons (AAOS) guideline recommendations for the prevention of venous thromboembolism (VTE).

Discuss the effects of various thromboprophylactic agents on post-operative functional outcomes and quality of life in TKA patients.

Self Assessment Questions:

True/False - The use of aspirin for VTE prophylaxis is recommended by both the CHEST guidelines and the AAOS guidelines.

Which of the following outcomes was significantly decreased in the 2003 study by Keays et al., comparing the use of aspirin versus enoxaparin post-operatively in TKA patients?

a) Pain
b) Time to goal range of motion
c) Incidence of bleeding
d) Quality of life
e) None of the above
f) All of the above

DEVELOPING CLINICAL SERVICES IN AN OUTPATIENT CHEMOTHERAPY INFUSION CENTER

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Statement of Purpose:
According to the National Cancer Institute (NCI), it is estimated that approximately 1.5 million people in the United States will be diagnosed with cancer in 2009. Based on NCIs Surveillance Epidemiology and End Results Cancer Statistics Review, the overall five-year relative survival rate for 1999-2005 was 66.1%. Given that such a significant number of the population is diagnosed with and survives cancer, it is important to offer appropriate therapy to provide patients with optimal healthcare outcomes. The purpose of this project is to develop and implement safe and cost-effective services and ensure patient satisfaction in a new chemotherapy infusion center.

Methods:
Developing protocols for chemotherapy-induced side effects, such as extravasation, anaphylaxis, and nausea/vomiting, will ensure safety for patients receiving chemotherapy at the infusion center. As an added security, a chemotherapy stability and dilution chart will be created for pharmacists to refer to while preparing chemotherapy orders. In order to help provide cost-effective care and minimize waste at the infusion center, the patients current chemotherapy regimens will be reviewed and data will be collected to help determine if a chemotherapy dose-rounding protocol should be implemented. Steps will also be taken to employ a patient assistance program to help ease the financial burden associated with cancer treatment. Assessing patient satisfaction and patient understanding of cancer and cancer-related issues will be achieved by providing patient surveys. Data from the surveys can then be used to make educational interventions and improvements to patient care.

Conclusions:
Developing clinical services in an outpatient chemotherapy infusion center will create a safe, cost-effective environment and improve workflow. These changes will also allow for more opportunities for clinical pharmacist roles in the future.

Learning Objectives:

Identify opportunities for improvement of safety, cost-effectiveness, and patient satisfaction in an outpatient chemotherapy infusion center.

Outline clinical services that pharmacists can provide in an outpatient chemotherapy infusion center.

Self Assessment Questions:

Assessment of chemotherapy dose rounding may provide a source of cost-savings.

Patient satisfaction may be determined through patient surveys of their experience at the outpatient infusion center.

IMPACT OF PHARMACIST INTERVENTION ON ANTIMICROBIAL THERAPY IN PATIENTS WITH URINE CULTURES BEING EMPIRICALLY TREATED WITH ANTIMICROBIALS.

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BACKGROUND INFORMATION: Antimicrobial stewardship programs (ASPs) are important in the appropriate selection of antimicrobials. Health care costs are a constant problem, with ASPs being a possible tactic to control drug spending and inappropriate use of medications. Decreasing the use of antimicrobials and targeting specific pathogens may lead to lower health care costs by lessening both the duration of patient stay and medication cost. ASPs could be of great benefit in the treatment of Urinary Tract Infections (UTIs). This condition is often treated improperly with antimicrobials, which leads to increases in both the costs of health care and resistance. Pharmacists may serve a role in decreasing the improper use of antimicrobials, which can slow drug resistance and decrease healthcare cost.

OBJECTIVE: Does pharmacist intervention based on ASP principles lead to de-escalation of antimicrobial therapy in patients with a suspected UTI?

METHODS: Patients will be selected based on retrieval of urine cultures (both positive and negative) from the hospitals computerized report generator. Once a patient has been selected, pharmacy will follow the patients lab values, cultures, and progress. The pharmacist will make recommendations on a standardized form for antimicrobial de-escalation based on current guidelines. Recommendations will be placed in the patient chart as a non-permanent communication form, with physicians completing the final change or approval. Data collected will include recommendation type, number of recommendations, and acceptance rate. The primary study outcome will be recommendation acceptance rate. Secondary outcomes include IV-to-PO switch rate, discontinuation rate of inappropriate therapy, rate of narrowing of antibiotic spectrum, and antibiotic cost.

RESULTS: Data collection is in progress at this time. Final results will be presented at the Great Lakes Pharmacy Resident Conference in April, 2010.

Learning Objectives:

Outline current guidelines and recommendations for the treatment of Urinary Tract Infections.

Identify areas where pharmacists can improve antimicrobial use in an inpatient setting.

Self Assessment Questions:

1.Which of the following patients should be treated for asymptomatic bacteriuria?
a.diabetic woman
b.person with a spinal cord injury
c.pregnant woman
d.catheterized patient with catheter in situ

2.True or False;
Men are always considered as having complicated UTIs.

EVALUATION OF RENAL FUNCTION IN VETERANS RECEIVING TENOFOVIR

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PURPOSE:
Tenofovir disoproxil fumarate (TDF) is a key agent in the treatment of human immunodeficiency virus-1 (HIV-1) infection. The primary objective of this study is to determine whether renal function over time differs between patients receiving TDF and those receiving nucleoside reverse transcriptase inhibitors (NRTIs) without TDF. Secondary objectives include description of the reasons for TDF discontinuation and the time frame for TDF-associated nephrotoxicity, as well as identification of other potential causes of renal dysfunction in this population.

METHODS:
This is a retrospective chart review of patients at Jesse Brown VA Medical Center from September 1999 to September 2009. Included patients must have a diagnosis of HIV-1 infection and also received at least 3 consecutive years of therapy with either a TDF or NRTI-based antiretroviral regimen during the study period. Patients with creatinine clearance less than 60 mL/min, polycystic kidney disease or recurrent glomerulonephritis prior to initiation of the antiretroviral regimen will be excluded from the study. For included patients, electronic medical records will be reviewed at 3-6 month intervals for the duration of the antiretroviral regimen. The following data will be collected from patient charts: Demographics (Age, gender, race, weight, height), presence of conditions associated with renal dysfunction, laboratory data (serum creatinine, CD4 count, HIV viral load), antiretroviral medications, potentially nephrotoxic medications and, when applicable, reason for discontinuation of TDF. From these data, a profile of creatinine clearance over time will be generated for both the TDF and NRTI-based therapy groups, allowing comparison of renal function between groups. Final conclusions will also consider the possible influence of demographics, other medical conditions and medications on renal function.

RESULTS:
Data collection and statistical analysis will be completed by April 2010. Final results with conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Recognize the importance of TDF in the treatment of HIV-1 infection.

Explain the risks and precautions for use of TDF in renal dysfunction.

Self Assessment Questions:

What is the recommended dose of TDF for a patient with creatinine clearance of 40 mL/min?
A.300mg Q48 H
B.300mg q 24 H

What is the recommended dose of TDF for a patient with creatinine clearance of 40 mL/min?
A.300mg Q48 H
B.300mg q 24 H
C.150mg q 72 H

Which of the following combination products contain(s) TDF?
A.Atripla
B.Truvada
C.Kaletra
D.A and B
E.None of the above

IMPACT OF A PHARMACIST-MANAGED CHEMOTHERAPY-INDUCED ANEMIA CLINIC

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The purpose of this research project is to assess the impact of the recently implemented pharmacist-managed chemotherapy-induced anemia (CIA) clinic at the University of Michigan. The specific aims of this study are to assess adherence to the Centers for Medicare and Medicaid Services (CMS) reimbursement guidelines for the use of erythropoietin stimulating agents (ESAs) in the treatment of CIA, to assess achievement of clinical endpoints in patients that are receiving ESAs for the treatment of CIA, and to estimate the financial impact of the pharmacist-managed anemia clinic. All endpoints will be compared between patients that were managed by a non-pharmacist provider prior to and during clinic implementation and patients that were enrolled in the pharmacist-managed CIA clinic and managed by pharmacists.

This is a single center, retrospective, observational IRB-approved study. All patients receiving ESAs for CIA at the University of Michigan outpatient cancer infusion prior to the initiation of a pharmacist-managed anemia clinic and patients managed outside the pharmacist-managed anemia clinic following its initiation will be included in the Usual Care group (May 2008 - August 2009). Patients receiving ESA therapy for CIA that were enrolled in the pharmacist-managed anemia clinic will be included in the Pharmacist-Managed group (October 2008 - August 2009).

Data collection includes demographic data, cancer diagnosis, chemotherapy regimen, ESA dosages, hemoglobin (Hgb) levels, iron studies, venous thromboembolic events, and reimbursement data. Outcome measures include percent adherence to CMS reimbursement guidelines, percent reimbursement for ESA therapy, achievement of a >1g/dL increase in Hgb or total Hgb >10g/dL after 4, 8 and 12 weeks of ESA therapy, and the attainment of Hgb level between 9.5 - 10.5g/dL at 4, 8, and 12 weeks following ESA initiation.

Preliminary results and conclusions for this study will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Recall the basics of the National Drug Determination for erythropoietin stimulating agents put forth by the Centers for Medicare and Medicaid Services

Discuss the impact of a pharmacist-managed chemotherapy-induced anemia clinic

Self Assessment Questions:

Which of the following treatment options can treat anemia?
a.Blood transfusions
b.Erythropoietin stimulating agents
c.Iron supplementation
d.All of the above

Which of the following parameters is not addressed in the Centers for Medicare and Medicaid Services National Coverage Determination for erythropoietin stimulating agents (ESA)?
a.Indication for ESA therapy
b.Starting ESA dose
c.ESA dose titration
d.Discontinuation of ESA therapy
e.None of the above

EVALUATION OF FALLS IN ELDERLY PATIENTS ENROLLED IN A VETERANS AFFAIRS HOME-BASED PRIMARY CARE PROGRAM

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Background
Falls are a major cause of morbidity and mortality in the elderly. Direct and indirect medical costs associated with falls are burdensome on the healthcare system. Educating health care providers about common medications that lead to falls may reduce their prescribing frequency in elderly patients, resulting in reduced rates of injury and health care costs.

Purpose
To determine if falls experienced by patients enrolled in a Home-Based Primary Care (HBPC) program correlate to specific medication use. Then, using the information obtained, educate the HBPC team about these fall risk factors and potential alternative therapies or strategies that may reduce or prevent further falls.

Methods
A retrospective chart review of patients enrolled in the HBPC program will be performed. All patient data will be obtained from password protected HBPC spreadsheets. Patients will be separated into two groups based on positive or negative history of falls. A fall will be defined as when a person descends abruptly due to the force of gravity and strikes a surface at the same or lower level. Both groups will be evaluated for initial Morse score upon enrollment in the HBPC program, number of drugs associated with high fall risk, total number of prescription medications up to time of initial fall if applicable, and diagnosis of fall-prone disease states. An updated post-fall Morse score after initial fall, cause of fall (if known), and number of subsequent falls will also be reviewed in those patients with a positive history of fall. Both groups will be compared and the most frequent causes of falls and potential ways to prevent them from occurring will be assessed. Educational session(s) and materials will be provided to members of the HBPC team based on results.

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

Learning Objectives:

Explain the components of the Morse Fall Scale (MFS) and its accuracy in predicting fall risk.

Review and identify common medication classes that can increase fall risk in elderly patients.

Self Assessment Questions:

The Joint Commission requires home care organizations to implement interventions to reduce falls? T/F

Which of the following medication classes is least likely to increase fall risk in an elderly patient?
a.Benzodiazepines
b.ACE inhibitors
c.Narcotic analgesics
d.Tricyclic antidepressants

DEVELOPMENT, IMPLEMENTATION, AND EVALUATION OF A RAPID ASPIRIN CHALLENGE-DESENSITIZATION GUIDELINE.

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PURPOSE
Heart disease and stroke are among the top three causes of death in the United States. Aspirin has many Class I recommendations that strongly support its use in the reduction of morbidity and mortality of athlerosclerotic disease. However, some patients may not initially qualify for aspirin therapy due to hypersensitivity.

The primary objective of this study is to develop, implement, and evaluate an evidence-based guideline and order set to facilitate the optimal management of rapid aspirin challenge-desensitization to 162 to 325mg of aspirin by mouth daily in patients who are at risk for the development of respiratory and/or cutaneous reactions. Secondary objectives are to describe the incidence of aspirin hypersensitivity amongst patients with coronary arterial disease (CAD), ischemic stroke, or peripheral arterial disease (PAD) and to evaluate the provision of appropriate treatment alternatives for the prevention of vascular events.

METHODS
The following will be used to meet the primary objective: a literature review of protocols, consensus of expert opinion, pharmacy and therapeutics committee approval, consultation with information technology services regarding order set creation, staff inservices, and an evaluation of the guideline/order set use for safety and efficacy.

To meet the secondary objective, a retrospective chart review will be conducted to assess subjects with documentation of aspirin hypersensitivity and co-existing atherosclerotic disease as identified by International Classification of Disease (ICD) 9 code. The inclusion criteria include: all inpatients admitted between July 2007 and July 2009 with documented aspirin hypersensitivity and at least one of the following conditions: CAD, ischemic stroke, and PAD. Each chart will be examined to determine type and onset (new vs. old diagnosis) of atherosclerotic disease, aspirin reaction type, reason for hospitalization, and medical intervention(s).

RESULTS
Final results with conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Describe the 2 mechanisms for hypersensitivity to aspirin.

Identify at least 1 situation where an aspirin challenge-desensitization guideline may be used.

Self Assessment Questions:

What are the 2 mechanisms for hypersensitivity to aspirin?

According to the American College of Cardiology/American Heart Association (ACC/AHA) 2007 guidelines for the management of patients with unstable angina/Non-ST-elevation myocardial infarction, patients who are allergic to aspirin should use clopidogrel alone (indefinitely) or try aspirin desensitization. True or False

EXPERIENCE WITH INTRAVENOUS KETOROLAC FOR ANALGESIA IN CHILDREN LESS THAN TWO YEARS OF AGE

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Purpose: Intravenous ketorolac has emerged as a preferred non-opioid analgesic therapy for children less than two years of age despite a paucity of clinical or pharmacokinetic data. This potent nonsteroidal anti-inflammatory agent is commonly administered as an adjunct to opioid analgesia or in place of opioids in moderate to severe pain at our institution. We aim to evaluate the efficacy of intravenous ketorolac analgesia in children less than 2 years of age as measured by a pain score documented post administration of dose. The safety of intravenous ketorolac analgesia, as measured by signs and symptoms of nonsteroidal anti-inflammatory related toxicities including increases in serum creatinine, decreased platelets, bleeding, nausea, vomiting, and rash will also be evaluated.

Design/Methods: Prior to commencement, this retrospective study was approved by the Human Investigation Committee as part of a larger study of pediatric pain. Electronic medical records of all patients aged 3 months to 2 years admitted to Childrens Hospital of Michigan (CHM) from December 15, 2006 through December 31, 2009 receiving at least one dose of intravenous ketorolac for analgesia were reviewed. Demographic and clinical characteristics, data on ketorolac dose and duration of therapy, corresponding pain scores, laboratory values, and outcome data obtained. A descriptive statistical analysis (SPSS version 17.0) was employed.

Results: To date, 227 electronic medical records of patients who received at least one dose of intravenous ketorolac during study period were reviewed, with 120 meeting inclusion criteria. Data analysis ongoing.

Conclusions: Preliminary data indicate that intravenous ketorolac therapy is commonly prescribed for children less than two years of age. Data determining safety and efficacy in this population will be presented at the conference.

Learning Objectives:

Describe the role of intravenous ketorolac in children less than 2 years of age

Identify monitoring parameters for the safe and effective use of intravenous ketorolac therapy in a child less than 2 years old

Self Assessment Questions:

1.The intravenous ketorolac dosing regimen for a 2 y.o. child with an acute post operative pain and normal renal function is:
a.0.5 mg/kg/dose IVPB Q6h for 10 days
b.0.25 mg/kg/dose IVPB Q6h for 10 days
c.0.5 mg/kg/dose IVPB Q6h for 5 days
d.1.5 mg/kg/dose IVPB Q6h for 10 days
e.30 mg/kg/dose IVPB Q6h for 10 days

2.Which parameters should be monitored in all patients receiving ketorolac therapy?
a.Serum creatinine
b.Clinical and laboratory signs/symptoms of bleeding
c.Albumin
d.A and B
e.All of the above

TREATMENT OF ACUTE AGITATION IN THE EMERGENCY DEPARTMENT: A REVIEW OF TREATMENT OPTIONS

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Purpose: Acutely agitated patients presenting to the Emergency Department should be considered a medical emergency because they are a risk to themselves and others. Benzodiazepines and haloperidol have been considered the drugs of choice to treat acute agitation and remain viable options for many patients. In recent years however, atypical antipsychotics have gained approval as acceptable alternatives to help treat acute agitation. The primary objectives of this study are to assess the effectiveness and safety of available treatment options for acutely agitated patients in the Emergency Department. The secondary objective is to assess for improvements in nursing documentation.

Methods: A retrospective chart review was conducted from December 2008 to January 2009. In December 2009, health care professionals involved in the treatment of acutely agitated patients were educated on various treatment options. Patients 18 years old and over in the Emergency Department who received an antipsychotic or lorazepam for acute agitation were eligible for inclusion in the study. Medication efficacy was determined by maintenance or reduction in agitation score. Documentation was scored based on information recorded during the encounter, and was considered adequate if it included precipitating event or medication indication and patient response post dose. In addition, patient encounters were evaluated for a potential link between underlying medical condition and the effectiveness of a particular medication.

Results: Episodes from 100 agitated patients who received an antipsychotic or lorazepam were reviewed as historical observations. Documentation was adequate 30% of the time and inadequate for the remainder. Despite receiving a score of adequate, drug efficacy or safety could not be assessed in any encounter. Medications prescribed were as follows: 82% lorazepam, 7% haloperidol, 9% lorazepam and haloperidol combination, and 2% quetiapine. Data collection post-education is currently in progress. Final results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

State three goals in the management of acute agitation.

Explain the benefits of using atypical antipsychotics in the treatment of acute agitation.

Self Assessment Questions:

What is the primary goal of the treatment of acute agitation?
a.)maintaining a safe environment
b.)minimizing effect on pharmacy budget
c.)selecting a medication with minimal side effects
d.)decreasing patient time spent in emergency department

An important characteristic of a medication used in the treatment of acute agitation:
a.)availability by oral route only
b.)causing sedation affecting the ability to further assess the patient
c.)estimated onset within minutes
d.)requires reconstitution

OUTCOMES OF THE IMPLEMENTATION OF A RENAL PHARMACIST SERVICE IN AN OUTPATIENT DIALYSIS UNIT OF A VETERANS HOSPITAL

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Purpose:
Anemia is common among patients with chronic kidney disease (CKD). Trials such as CHOIR, CREATE, and TREAT have demonstrated negative cardiovascular and neurological outcomes associated with hemoglobin (Hgb) targets > 13 g/dL. To reflect these findings, the National Kidney Foundation recommends an ideal Hgb concentration of 11-12 g/dL. Studies have described physician time-constraints, a shortage of nephrologists, suboptimal coordination of care, and delayed referral of patients by primary care physicians as reasons for inadequate management of anemia in CKD. In September, 2008, Edward Hines, Jr. VA Hospital hired a renal clinical pharmacist. The objective of this study is to evaluate the impact, both clinically and economically, of a pharmacist on anemia and metabolic bone disorder (MBD) in end stage renal disease (ESRD) in an outpatient dialysis unit of a veterans hospital.

Methods:
This will be a retrospective chart review of ESRD patients who participated in the renal dialysis program at Hines VA Hospital. Of the charts reviewed, the intervention of implementing a renal pharmacist in the dialysis unit will be evaluated in a pre- and post-intervention fashion from November 2007 - October 2008 and November 2008 - October 2009, respectively. Medical charts will be accessed through the computerized patient record system (CPRS). Exclusion criteria include peritoneal dialysis, active cancer receiving chemotherapy, parathyroidectomy, active gastrointestinal bleeding, and chronic systemic corticosteroids. The primary endpoint will be the average number Hgb > 13 g/dL before and after implementation. Secondary endpoints that evaluate management of anemia and MBD in ESRD will also be measured.

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

Learning Objectives:

Discuss the current recommendations for treating anemia in CKD and MBD as specified by K/DOQI.

List key findings from the CHOIR, CREATE, and TREAT trials and describe how these findings support the advent of a renal pharmacist.

Self Assessment Questions:

True or False: Per K/DOQI, the frequency of Hgb monitoring in patients treated with erythropoietin stimulating agents (ESAs) should be at least monthly.

True or False: The TREAT trial demonstrated statistically significant increases in fatal/non fatal strokes when darbepoetin therapy was compared to placebo in patients targeted to Hgb > 13 g/dL.

INCREASING PATIENT SATISFACTION THROUGH THE CREATION OF A MEDICATION COLLECTION PROGRAM IN MULTIPLE OUTPATIENT PHARMACIES

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Purpose: The American Society of Health-System Pharmacists 2015 initiative challenges health-system pharmacy departments to increase the extent to which they engage in public health initiatives on behalf of their communities. A current public health concern in our community is groundwater contamination due to improper disposal of medications. Prior to the initiation of this program, Froedtert Hospitals three outpatient pharmacies did not offer medication collection. In an effort to increase patient satisfaction, a medication collection program was created.

Methods: Froedtert Hospitals three onsite outpatient pharmacies implemented the medication collection program starting in November 2009. Pharmacy staff collect non-controlled medications continuously during business hours. Staff sort through each patients medications, with the patient present, and return all controlled medications back to the patient due to strict federal regulations prohibiting controlled medication collection. Staff provide the patient with information detailing alternative options for disposal of controlled medications. Staff complete a survey at each encounter documenting the names of the medications collected, reasons why the patient is disposing the medications, how the patient would have disposed the medications if this program was not available, the number of controlled substances the patient intended to dispose, and the approximate amount of time spent during each encounter. Patients and staff are being surveyed to assess their satisfaction with the program. Pharmacy technicians are able to perform all aspects of the program. Medications will periodically be picked up by a reverse distributor for proper incineration. Surveys will be analyzed to determine what types of medications are being collected and how the program is affecting patient and staff satisfaction. These potential benefits will be weighed against the cost of staff time and medication incineration services to justify future development and expansion of the disposal program.

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

Learning Objectives:

Describe the steps necessary to implement a medication collection program.

List several reasons why a medication collection program is important to a community.

Self Assessment Questions:

True/False: Waste water treatment plants are equipped to remove all medications from the drinking water supply.

True/False: Pharmacy staff can collect controlled substances in Wisconsin.

VANCOMYCIN SERUM CONCENTRATIONS IN PATIENTS WITH SEPTIC SHOCK RECEIVING EARLY GOAL-DIRECTED THERAPY

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Purpose: Early goal directed therapy (EGDT) is a multi-component therapeutic protocol consisting of the administration of aggressive fluid resuscitation, vasoactive agents, blood transfusions, and antimicrobial therapy that has been proven to reduce mortality from septic shock. Combined with the pathophysiology of severe sepsis, EGDT may impact the pharmacokinetic parameters of commonly used antimicrobials, such as vancomycin. Serum vancomycin trough concentrations are routinely obtained to optimize clinical outcomes. According to treatment recommendations, serum vancomycin concentrations should be maintained between 15-20 mg/L for complicated infections. Therefore, the primary objective of this study was to describe the incidence of sub-optimal serum vancomycin concentrations (< 15 mg/L) in adult patients with septic shock after receiving EGDT. The secondary objective was to determine independent predictors of sub-optimal vancomycin serum concentrations.

Methods: In this retrospective cohort study, patients with septic shock and severe sepsis were identified using ICD-9 codes from hospital disease, procedure, and medication databases. Data was abstracted electronically and via chart review. Patients receiving EGDT and vancomycin were included for evaluation. Exclusion criteria included patients transferred from outside institutions after initiation of vancomycin, receipt of vancomycin in the 96 hours prior to EGDT, lack of a serum vancomycin concentration drawn within 96 hours after starting therapy, cystic fibrosis, or pregnancy. A sample size of 200 patients was needed to detect a 10% difference in the primary endpoint, the incidence of sub-optimal serum vancomycin concentrations, with an 80% power and an a prior alpha of 0.05. The primary endpoint was analyzed using descriptive statistics, including mean, median, mode, and inter-quartile range. Independent variables associated with serum concentrations < 15 mg/L were determined using a multivariable, stepwise logistic regression model and were analyzed using inferential statistics, including Chi-square or Fishers exact tests, Students t-test or Mann-Whitney U test.

Results: To be presented

Conclusions: To be presented

Learning Objectives:

Evaluate why patients in septic shock who receive EGDT may have sub-optimal serum vancomycin trough concentrations

Assess which patients in clinical practice are more at risk for having a sub-optimal serum vancomycin trough concentration

Self Assessment Questions:

Why would fluid intake be important to consider when dosing vancomycin?

What is the current recommended goal serum vancomycin trough concentration range for complicated infections?

USING RELATIVE VALUE UNITS (RVUS) TO ALLOCATE PEDIATRIC PHARMACY STAFFING RESOURCES

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Purpose: To create a RVU system to allocate staffing levels in a pediatric pharmacy department that adjust as various dispensing functions fluctuate.

Methods: Six dispensing functions were categorized as: unit dose, automated dispensing cabinets (ADC) doses, IV compounds, oral syringes, total parental nutrition (TPNs), and hazardous drugs. Time studies will be done to determine relative value for each function. Each relative value will be multiplied by the volume of each dispensing function to create a weighted RVU and help determine full time equivalent (FTE) staffing levels.

Results: To be presented at the conference.

Learning Objectives:

Identify the importance for having a productivity metric in place within the pharmacy department.

Understand the process to create a RVU system within the pharmacy department.

Self Assessment Questions:

How many institutions currently use a productivity metric to allocate appropriate staffing levels?

How often do you re-evaluate your staffing levels based on patient volume?

THE EFFECT OF PHARMACIST PROVIDED EDUCATION ON MEDICATION-RELATED HCAHPS SCORES

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Purpose:
The provision of appropriate patient education regarding newly prescribed medications is one of the key factors relating to patient satisfaction with their hospital care. As a way to evaluate patient satisfaction with the care they received, the HCAHPS (Hospital Consumer Assessment of Healthcare Providers and Systems) survey poses 27 questions to patients, three of which inquire about education on new medications. The most recent nationwide survey from hospitals reporting HCAHPS scores indicated that only 59% of patients had "always" received an explanation about new medications before receiving them. In comparison, as of January 2010, the NorthShore University HealthSystem YTD average for HCAHPS scores for communication about new medications was 52%. These numbers clearly indicate the need for improved medication education at NorthShore. The purpose of this project is to increase medication-related HCAHPS scores by implementing pharmacist provided education on new medications to newly admitted patients on medicine units.

Methods:
Pharmacist-provided patient education was implemented in conjunction with on-going nursing education of patients. Documentation of education by both disciplines has been standardized. Scores for medication-related HCAHPS questions are collected via phone interview by external consultants at Professional Research Consultants, Inc (PRC). Approximately 50 random discharged patients per unit per quarter are surveyed by PRC, and scores from all patients will be included. Baseline HCAHPS scores have been retrieved via PRC data from the 2009 average. Monthly scores obtained from the PRC website, and provided by the NorthShore Quality Department, will be utilized to compare to baseline scores. Scores will be documented for the purpose of this project through June 2010.

Learning Objectives:

Describe the relevance of HCAHPS scores and how these scores relate to pharmacy practice.

Identify at least three ways in which pharmacist provided education on new medications enhances patient care.

Self Assessment Questions:

True or False: The medication-related HCAHPS questions ask if patients received information regarding indication and potential side effects of new medications prior to administration.

True or False: One of the ASHP 2015 initiative objectives is that 80% of recently hospitalized patients (or their caregivers) will recall speaking with a pharmacist while in the hospital.

EVALUATING SAFETY AND EFFICACY OF PROPHYLACTIC ENOXAPARIN DOSING IN ROUX-EN-Y GASTRIC BYPASS SURGERY PATIENTS AT THE ST. VINCENT CARMEL BARIATRIC CENTER OF EXCELLENCE

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PURPOSE: The current FDA-approved venous thromboembolism (VTE) prophylaxis dosing regimen for enoxaparin is based on a fixed dosing regimen irrespective of body mass index (BMI). Published guidelines for VTE prophylaxis recommend enoxaparin 30mg twice daily, 40mg daily or, if renal insufficiency is present, a reduced dose of 30 mg daily. However, various studies suggest that the FDA-approved dosing regimens for prophylaxis may be inadequate for obese patients. Currently, at the St. Vincent Carmel Bariatric Center of Excellence, physicians opt for various dosing regimens without consensus.

OBJECTIVES: The primary objective is to assess the effect of current prophylactic enoxaparin dosing regimens on anti-factor-Xa concentrations in patients undergoing bariatric surgery at St. Vincent Carmel Hospital. Secondary objectives include comparing the frequency of thromboembolic and hemorrhagic events, occurring within the first month after surgery, associated with the various enoxaparin dosing strategies; identifying possible relationships between co-morbidities and thrombotic or hemorrhagic events and examining the incidence of thrombotic or hemorrhagic events in relation to the dose of enoxaparin as it correlates to the patients actual body weight (ABW) and body mass index (BMI).

METHODS: This prospective study will examine 150 patients undergoing primary Roux-en-Y gastric bypass surgery at St. Vincent Carmel Hospital between December 2009 and March 2010. Patients will receive prophylactic enoxaparin per physician order. Anti-factor-Xa concentrationls will be obtained at steady-state (approximately four hours after the third enoxaparin dose). Patients charts will be reviewed to obtain demographics, past medical history, treatment information, and outcomes. The study will include patients undergoing primary Roux-en-Y gastric bypass surgeries and who are at least 18 years of age. Patients receiving anticoagulation therapy prior to admission for surgery or if they did not receive enoxaparin for VTE prophylaxis after surgery will be excluded.

RESULTS: Results will be presented at Great Lakes Residency Conference.

Learning Objectives:

Identify pharmacokinetic and pharmacodynamic changes due to obesity.

Identify risk factors for VTE.

Self Assessment Questions:

Obesity is not a risk factor for VTE.

True False

Obesity does not alter pharmacokinetics of enoxaparin.

True False

EVALUATING THE USE OF AN ALGORITHM IN THE MANAGEMENT OF HYPERTENSION IN PATIENTS INFECTED WITH HUMAN IMMUNODEFICIENCY VIRUS: A RETROSPECTIVE REVIEW OF AN OUTPATIENT CLINIC

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Purpose
The purpose of this study was to evaluate the implementation of an algorithm in the treatment and appropriateness of therapy for hypertension in human immunodeficiency virus (HIV) infected patients at an outpatient clinic.
Methods
A retrospective electronic chart review completed by a previous pilot project at an outpatient HIV clinic identified 50 randomly selected HIV patients diagnosed with hypertension based on International Classification of Diseases, Ninth Revision (ICD-9) codes between January 2005 and September 2007. Charts were reviewed and assessed for hypertension control and appropriateness of therapy based on the Seventh Report of the Joint National Committee (JNC-VII) guidelines. Educational materials and a hypertension management algorithm were implemented at the clinic. This study conducted a second retrospective chart review, similar to the first, to analyze the effects of the treatment algorithm on blood pressure control between June 2008 and October 2009.
Results
The implementation of a treatment algorithm did not significantly improve blood pressure control in HIV-infected patients diagnosed with hypertension compared to before implementation (70% vs. 66%; p = 0.83). Patients who reached goal blood pressure on appropriate therapy also were not improved after intervention (52% vs. 44%; p = 0.55). However, the percent of patients on appropriate therapy was increased (44% vs. 74%; p=0.0042).
Conclusion
The implementation of a treatment algorithm did not significantly improve blood pressure control in HIV-infected patients diagnosed with hypertension, but the use of appropriate antihypertensive therapy was significantly improved. Although the study did not find a statistically significant improvement in the primary endpoint, awareness to the primary care providers of the clinic was raised regarding the importance of adequately treating other disease states HIV-infected patients are now experiencing as a result of increased life expectancy.

Learning Objectives:

Discuss the importance of hypertension treatment in patients infected with HIV.

Recognize and explain blood pressure goals and pharmacologic therapies based on JNC-VII guidelines.

Self Assessment Questions:

1.Which of the following comorbidities has a goal blood pressure of less than 130/80 mmHg according to JNC-VII guidelines?
a)diabetes mellitus, hyperlipidemia, chronic kidney disease, heart failure
b)diabetes mellitus, hyperlipidemia, chronic kidney disease
c)diabetes mellitus, chronic kidney disease
d)diabetes mellitus
e)None of the above

2.Which of the following antiretroviral drug classes is associated with lipodystrophy and metabolic syndrome which can increase the risk of developing hypertension?
a)nucleoside reverse transcriptase inhibitors
b)non-nucleoside reverse transcriptase inhibitors
c)protease inhibitors
d)integrase inhibitors
e)fusion inhibitors

EVALUATING THE ECONOMIC IMPACT OF PLERIXAFOR ADMINISTRATION DURING STEM CELL MOBILIZATION IN PATIENTS WITH MULTIPLE MYELOMA AND NON-HODGKINS LYMPHOMA

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Purpose: Peripherally harvested products have replaced bone marrow as the primary source of stem cells for autologous transplantation in patients with multiple myeloma (MM) and non-Hodgkins lymphoma (NHL). Traditional mobilization strategies include administration of granulocyte colony-stimulating factor (G-CSF) alone or in combination with chemotherapy. With these methods, 5-8% of patients with MM and 20-30% of patients with NHL fail to mobilize enough stem cells to proceed to transplantation. Plerixafor was approved by the Food and Drug Administration for use in combination with G-CSF to improve mobilization in MM and NHL patients. Plerixafor is a chemokine receptor 4 (CXCR4) inhibitor that promotes migration of stem cells from bone marrow into the peripheral circulation. Its use has allowed a greater number of patients to undergo successful mobilization including those who were previous failures, while potentially utilizing fewer health care resources. This study will evaluate the economic impact of using plerixafor in combination with G-CSF to mobilize MM and NHL patients compared with traditional mobilization strategies.

Methods: This study received Institutional Review Board exempt approval. The health systems electronic medical record system was used to identify MM and NHL patients who received G-CSF alone, G-CSF with chemotherapy, or G-CSF with plerixafor for mobilization. The following information is being collected: type of malignancy, therapy received, days required for successful mobilization, cost of G-CSF, chemotherapy, and plerixafor, BMT laboratory fees, apheresis fees, and hospital charges in the event of therapy related re-admissions. Mean total healthcare cost during the mobilization period will be compared between treatment groups.

Results and Conclusion: Data collection and analysis are ongoing. Final results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Identify risk factors for mobilization failure in patients with MM and NHL

Discuss the economic and clinical outcomes of plerixafor use in MM and NHL patients compared with traditional mobilization strategies

Self Assessment Questions:

Which of the following are risk factors associated with mobilization failure in NHL patients?
a. Age greater than 59 years
b.Any prior radiation therapy
c.Greater than 9 cycles of prior chemotherapy
d.All of the above

True/False: Plerixafor has only been studied when used in combination with G-CSF.

EVALUATION OF SEDATION ASSESSMENT BY PHARMACY AND NURSING IN AN INTENSIVE CARE UNIT

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Background
Accurate assessment of sedation and delirium is an essential component in evaluating and managing critically ill patients. Ensuring appropriate interpretation of sedation scales would improve adherence to daily awakening trials, decreasing the potential for complications from sedative therapy. Current daily sedation assessments may not be accurately representing the level of sedation for each patient and reinforcement of appropriate sedation and delirium assessment is needed.

Purpose
The purpose of this study is to examine the difference in sedation assessment interpretation between pharmacists and nurses after completing educational sessions. The secondary objective will evaluate the relationship between the accuracy of sedation assessments between pharmacists and nurses with patient outcomes.

Methods
Educational efforts will be focused on areas of deficiency found in a previous study of pharmacist and nursing assessment of sedation. One-on-one educational sessions will be completed for one month prior to data collection. Data will be collected in mechanically ventilated patients > 17 years old admitted to intensive care. Patients with neurocognitive dysfunction and those receiving end of life care will be excluded. For eligible patients, the following data will be collected: gender, age, height, weight, duration of mechanical ventilation, sedative, analgesic, anti-delirium medication use, documentation of spontaneous awakening trials, nurses sedation assessment using the Richmond Agitation and Sedation Scale (RASS) and the Modified Ramsey Sedation Score (MRSS), concomitant pharmacists sedation assessment (RASS, MRSS), and delirium score (CAM-ICU). The results of this study will be used to ensure compliance and utilization of the sedation, analgesia, and delirium initiatives. Comparison data from a previous study will be used to evaluate the impact of the educational sessions.

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

Learning Objectives:

Describe the different methods of sedation assessment.

Identify the impact of sedation assessment and delirium in the ICU.

Self Assessment Questions:

T or F: The majority of patients require a Richmond Agitation and Sedation Scale (RASS) goal of +1 to -1 if not receiving neuromuscular blocking agents.

T or F: The development of delirium during an ICU stay does not impact mortality.

DEVELOPMENT AND IMPLEMENTATION OF A TRACKING SYSTEM FOR WARFARIN THERAPY ATRIAL FIBRILLATION PATIENTS

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Purpose: The Joint Commission National Patient Safety Goal 3E calls for practice sites to reduce the likelihood of patient harm associated with the use of anticoagulant therapy, such as warfarin. To meet this goal, and improve patient adherence to INR checks, a proper system of documentation of patient care activities and good communication with the patient is a necessity. The purpose of this project is to identify or develop an electronic tracking system for warfarin therapy patients to improve adherence to INR draw days and to manage documentation of patients who receive warfarin education. Adherence to INR draws is defined as less than a 5 day lapse from the scheduled INR check. Primary Endpoint: Increased adherence to INR draws to greater than 75% of patient population. Secondary Endpoints: Increased attainment of therapeutic INR goal to greater than 50% of population and increased patient notification of next INR draw to greater than 90% of population.

Methods: This study will be conducted at ProMed Family Practice Center at Woodbridge Hills. The study consists of three parts as follows: 1) developing or identifying an electronic tracking system for warfarin patients 2) identification of atrial fibrillation patients on warfarin therapy at the study site 3) tracking patient adherence to INR checks through implementation of the electronic tracking system.

Results/Conclusion: Research is currently in the data collection phase. The electronic tracking systems evaluated and the identification of atrial fibrillation patients on warfarin therapy will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Identify the patient risks associated with improper warfarin therapy tracking and documentation.

Discuss the benefits and limitations of electronic warfarin tracking systems.

Self Assessment Questions:

1. Improper warfarin therapy tracking may result in:
A)Sub-therapeutic INRs
B)Supra-therapeutic INRs
C)Pulmonary embolism
D)All of the above

2. T or F: Web-based electronic warfarin tracking systems enable healthcare providers to access patient records at multiple locations.

TACROLIMUS BLOOD CONCENTRATIONS AND EFFECT ON MORBIDITY AND MORTALITY IN PATIENTS WITH HEMATOLOGIC MALIGNANCIES RECEIVING ALLOGENEIC STEM CELL TRANSPLANT

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Purpose:
Goal tacrolimus levels for patients undergoing allogeneic hematopoietic stem cell transplant (HSCT) have yet to be firmly established. Current practice at the University of Illinois Medical Center guides clinicians to target a range of 5 to 15 ng/mL. It remains unknown if a smaller target range may be associated with improved outcomes along with lower rates of treatment-related morbidity. The primary objective of this study is to assess efficacy outcomes such as engraftment, progression free survival, and overall survival in relation to mean tacrolimus levels in allogeneic HPSCT recipients. Secondary objectives are to assess treatment-related morbidity such as graft-versus-host disease (GVHD), infection, mucositis, sinusoidal-obstructive syndrome (SOS), nephrotoxicity, neurotoxicity, electrolyte abnormalities, and hypertension.

Methods:
The central database for the University of Illinois at Chicago Stem Cell Transplant Team will be used to identify allogeneic HPSCT recipients from January 1, 1999 through January 1, 2009 who received tacrolimus for prevention of graft rejection and GVHD. Data collection will include patient demographic information, anthropometric values, co-morbid conditions, concurrent medication use, and conditioning chemotherapy regimen for HPSCT. Serial laboratory parameters collected include serum tacrolimus concentrations, metabolic panel, creatinine clearance, calcium, phosphorous, magnesium, lactate dehydrogenase, aspartate aminotransferase, alanine aminotransferase, alkaline phosphatase, total bilirubin, direct bilirubin, protein, albumin, complete blood count with differential, and cytomegalovirus (CMV) polymerase chain reaction (PCR) titers. Efficacy criteria will be measured by determining time to engraftment, time to disease relapse, and all cause mortality. Toxicity outcomes will be assessed based on incidence of mucositis, GVHD, SOS, infection, elevated blood pressure, neurotoxicity, and nephrotoxicity.

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

Learning Objectives:

Describe the mechanism of action of tacrolimus and its role in allogeneic hematopoietic stem cell transplant (HSCT).

Identify the major tacrolimus-associated toxicities seen in HSCT.

Self Assessment Questions:

Tacrolimus is a calcineurin inhibitor that prevents T-cell activation.
a.True
b.False

Which of the following is NOT a toxicity that is directly attributable to tacrolimus use?
a.Electrolyte disturbances
b.Neurotoxicity
c.Nephrotoxicity
d.Mucositis
e.Hypertension

DEPRESSION AND ANTIDEPRESSANT USE BEFORE & DURING INTERFERON TREATMENT FOR HEPATITIS C (HCV)

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PURPOSE:
Chronic HCV is the major cause of liver disease in the United States with an estimated prevalence of 4 million. The treatment of choice for HCV is interferon (IFN) or pegylated interferon (Peg-IFN) with or without ribavirin. Up to 70% of patients treated with IFN experience psychiatric disturbances which are correlated to poor HCV treatment adherence. The purpose of this study is to examine documented psychiatric symptoms and antidepressant utilization over the course of interferon treatment in HCV+ patients.
METHODS:
This is a retrospective chart review examining subjects ≥18 years of age treated for HCV with Peg-IFN with or without ribavirin, between 7/1/1999 - 8/31/2009 at a Liver Clinic in a University Medical Center. Data collected include baseline demographic, psychosocial risk factors and modes of HCV transmission prior to initiating HCV therapy. Antidepressant use and baseline labs including genotype and HCV RNA levels will be collected. Descriptive analyses will be conducted to determine the prevalence of documented depressive symptoms and antidepressant use prior to and at the completion of HCV therapy. T-tests, Analysis of variance, or non-parametric equivalents will be used to assess differences in the incidence of depression and antidepressant use across gender, race, and ethnic groups at baseline, every six months of therapy, and at the completion of therapy. The relationship of antidepressant utilization or documented depressive symptoms with loss to follow-up during treatment will be assessed using logistic regression.
RESULTS:
Preliminary data has been collected on 101 patients (42 Black, 29 Caucasian, 20 Hispanic, 10 other). The mean age was 48 years (range: 22-68) with 63.4% males. The majority of patients had genotype 1 (68.4%). Twenty-nine patients were initiated on a new antidepressant or had the dose of a current antidepressant increased during HCV therapy. Final analyses will be presented at the Great Lakes Residency Conference.

Learning Objectives:

List potential complications of untreated HCV

Describe the complications of psychiatric adverse effects that occur during HCV therapy

Self Assessment Questions:

Which of the following factor make a patient a better candidate for achieving sustained virological response to HCV therapy?
a. Genotype 1 disease
b. Black race
c. Uncontrolled diabetes
d. HCV RNA level less than 300,000 IU/mL

True or False:
The incident of psychiatric adverse effects associated with interferon or pegylated interferon therapy ranges between 5% to 20%.

DEVELOPING A COMBINATION ANTIBIOGRAM FOR PSEUDOMONAS AERUGINOSA AND ACINETOBACTER BAUMANNII

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Purpose: A combination antibiogram will be constructed to aid clinicians in determining which two agents will give the highest probability of coverage against A. baumannii and P. aeruginosa, and which beta-lactam serves as an appropriate alternative to piperacillin-tazobactam against P. aeruginosa. Methods: Hospitalized patients with A. baumanni or P. aeruginosa infections between January 2008 and December 2008 will be identified from the records of the Rush University Medical Centers clinical microbiology laboratory. A. baumannii and P. aeruginosa isolates were identified and susceptibilities noted following Clinical and Laboratory Standards Institute [CSLI] criteria. The new MIC breakpoint of 16 will be used when categorizing agents as susceptible or resistant. Each A. baumannii and P. aeruginosa isolate will be evaluated for susceptibility with one agent; each isolate found resistant to this agent will be examined for susceptibility to a second agent The susceptibilities of amoxicillin/clavulanate, ampicillin/ sulbactam, ceftriaxone, cefipime, imipenem, levofloxacin, trimethoprim/sulfamethoxazole, gentamycin, tobramycin, and amikacin against 39 isolates of acinetobacter will be evaluated. The total susceptibility with 2 agents will be the percentage of isolates found susceptible to at least 1 of the 2 agents tested. This process will be repeated for the 325 P. aeruginosa isolates; each isolate will be tested for susceptibility with beta-lactams such as piperacillin-tazobactam, cefepime, imipenem, and aztreonam. The total susceptibility of using 2 agents will therefore be a percentage of isolates that are susceptible to 1 of the 2 agents tested. There will be a comparison of combination therapy and monotherapy to determine the added benefit or lack of benefit that can be expected with specific combinations of antibiotic treatments. Conclusion: A combination antibiogram will allow clinicians some perspective of the total activity afforded by two agents; this will guide optimal empiric antibiotic selection and decision making between monotherapy and combination therapy.

Learning Objectives:

Describe which combination of antibiotics provides the best probability of activity against pseudomonas aeruginosa

Describe which combination of antibiotics provides the best probability of activity against acinetobacter baumannii

Self Assessment Questions:

What is a limitation of this project?

Why are these particular organisms being studied?

PREVENTING SYSTEMIC CHEMOTHERAPY DOSE REDUCTIONS AND DELAYS TO IMPROVE THE RELATIVE DOSE INTENSITY AT SPARROW REGIONAL CANCER CENTER: A QUALITY IMPROVEMENT INITIATIVE

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Purpose: Chemotherapy dose intensity is defined as the dose given per unit body surface area per unit time. The relative dose intensity (RDI) is the ratio of the delivered dose intensity to the standard dose intensity. In clinical trials, a survival benefit has been demonstrated in patients receiving chemotherapy with an RDI ≥ 85%. In a retrospective study performed at Sparrow Regional Cancer Center (SRCC), the overall RDI of systemic chemotherapy was determined to be 83%. Potential reasons for this finding may have been related to chemotherapy dose reductions and/or delays. Targets for improving the RDI may include increasing the utilization of colony-stimulating factors and preventing cancellation-related delays in chemotherapy. The purpose of this study is to improve the utilization of colony-stimulating factors and to develop a cancellation protocol thereby improving patient adherence with chemotherapy administration.

Methods: This study will be conducted in four different phases. The first phase, a one-month pilot study, will involve evaluation of chemotherapy orders from SRCC to determine the frequency of chemotherapy visit cancellations and the incidence of colony-stimulating factor utilization. Next, a policy will be developed: 1) promoting improved adherence with scheduled chemotherapy administration and reducing cancellations and 2) assessing risk factors for febrile neutropenia and identifying high risk patients who may qualify for colony-stimulating factor prophylaxis. Following policy development and staff education, a two to three month implementation period will ensue. Finally, the RDI of systemic chemotherapy at SRCC will be prospectively determined.

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

Learning Objectives:

Explain the relationship between relative dose intensity and dose reductions and/or delays.

Recognize common treatment and non-treatment-related reasons for reduced relative dose intensity.

Self Assessment Questions:

How do dose reductions potentially compromise the survival rates for curable malignancies?

A)Less tumor cell death with each cycle resulting in higher tumor cell counts at the end of each cycle
B)More tumor re-growth between cycles resulting in higher tumor cell counts at the end of each cycle
C)More tumor cell death with each cycle resulting in higher tumor cell counts at the end of each cycle
D)Less tumor re-growth between cycles resulting in lower tumor cell counts at the end of each cycle

What is the most important reason for reduced relative dose intensity during a course of chemotherapy?

A)Poor physical condition
B)Knowledge deficit
C)Myelosuppresion
D)Visit cancellations

ACHIEVEMENT OF GOAL TEMPERATURE WITH INDUCED HYPOTHERMIA

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PURPOSE: Induced hypothermia is a technique used post-cardiac arrest to reduce the overall metabolic rate. It is defined as intentional lowering of central body temperature to a level below that which is required for proper metabolic functioning. The recommended target for post-cardiac arrest patients is mild hypothermia, or 32-34C. Reducing tissue metabolism by inducing hypothermia in post-cardiac arrest patients has been proven to reduce mortality and improve neurologic outcomes. Methodist Hospital uses six hours as a goal time from return of spontaneous circulation to target temperature and two hours as a goal time from initiation of induced hypothermia to target temperature. While the benefits of induced hypothermia have been proven to outweigh the risks, patient-specific factors affecting the achievement of goal target temperature within two hours of initiation of induced hypothermia have not been established. The International Liason Committee on Resuscitation recommends induced hypothermia for 12-24 hours for the treatment of cardiac arrest when the initial rhythm is ventricular fibrillation. The objective of this study is to compare mortality and functional outcomes of patients who achieve goal target temperature within two hours of initiation of induced hypothermia to those who do not.

METHODS: For this retrospective, observational cohort study, post-cardiac arrest patients admitted to Methodist Hospital and treated with induced hypothermia between January 2009 and December 2009 were included. Patients less than 18 years of age or pregnant were excluded. Primary outcomes included functional outcome measured by the Glasgow Coma Scale and Cerebral Performance Categories, mortality at hospital discharge, and disposition of patients who achieved target temperature within two hours compared to those who did not. Secondary outcomes included characteristics of patients who achieved target temperature within two hours compared to those who did not, such as BMI and use of sedatives and paralytics.

RESULTS/CONCLUSIONS: To be presented.

Learning Objectives:

Define induced hypothermia.

Describe the proposed benefits of induced hypothermia.

Self Assessment Questions:

What is the target core temperature for patients undergoing induced hypothermia?

What is the initial heart rhythm for which induced hypothermia is indicated by ILCOR?

EFFECT OF THE ASTHMA COLLABORATIVE TREATMENT (ACT) CLINIC ON PATIENT OUTCOMES

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Asthma affects approximately 22.9 million Americans, with 12.3 million having an exacerbation each year. Most exacerbations are preventable with appropriate outpatient management and follow-up. Patients with suboptimal control have poor outcomes. The 2008 National Asthma Education and Prevention Program emphasized education and partnership to improve patient self-management.

The aim of this study was to develop and implement an interdisciplinary practice between pharmacists, medical residents, and attending physicians. The primary objective is to assess changes in Quality of Life (QOL) outcomes, inhaler technique, and rescue inhaler use from baseline to completion of study. Secondary objectives will be to evaluate and compare the number of asthma-related physician appointments, ER visits, or hospital admissions during the study period.

Methodology

This was a prospective, randomized trial of asthmatic patients treated in a medical resident internal medicine clinic at a community teaching hospital. A physician/pharmacist practice agreement was designed to allow the pharmacist to assess patients and adjust therapy according to guidelines. Qualifying patients were mailed an overview of the study and asked to complete and return a self-management questionnaire. Those who responded were randomized to intervention 1 or 2 and scheduled an appointment to complete informed consent, the Asthma Quality of Life Questionnaire (AQLQ), and an asthma history taken. Intervention 1 received current clinic interventions.
Intervention 2 underwent an evaluation of inhaler technique and a therapeutic plan was designed and discussed with an attending physician. Patients were provided extensive education and an asthma action plan that promotes self-management.

All patients will have a 3-month follow-up to complete the self-management questionnaire, the AQLQ and reassessment of symptoms.

Results

Data collection and statistical analysis will be completed by April 2009. Final results and conclusion will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Become familiar with asthma guideline recommendations.

Explain the current study designed to evaluate the pharmacists role in improving outcomes for asthmatic patients in the primary care setting.

Self Assessment Questions:

Every asthmatic should have access to which of the following medications?
a.SABA
b.ICS
c.LABA
d.LEI

True or False: When the diagnosis of asthma is made, an asthma action plan should be completed for the patient.

RETROSPECTIVE CHART REVIEW OF CLINICAL OUTCOMES AND PROTOCOL UTILIZATION FOR THE ALCOHOL WITHDRAWAL SYNDROME PROTOCOL

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PURPOSE: Up to twenty-five percent of hospitalized medical patients have alcohol abuse disorders. Recent data supports using symptom-triggered therapy with shorter-acting benzodiazepines (BZD) such as lorazepam. Nurses monitor patient-specific symptoms and give medication as needed based on patient assessment scores. The primary objective of this study is to assess clinical outcomes of patients treated with the new Alcohol Withdrawal Syndrome (AWS) protocol at Beaumont, Royal Oak (BH-RO) compared to patients treated with fixed-dose therapy. This study will also assess whether the protocol was used appropriately, if patients met criteria for use, had contraindications to its use, or experienced alcohol withdrawal-related events.

METHODS: This is a retrospective chart review. Patients treated for AWS at BH-RO between January to June 2008 and January to June 2009 were included. The first fifty patients treated for AWS in 2008 will be included in the fixed-dose treatment cohort while the first fifty patients treated for AWS in 2009 will be included in the symptom-triggered treatment cohort. Patients were excluded if they received other BZD besides lorazepam while on the AWS protocol. Clinical outcomes such as length of stay, duration and amount of BZD administered, appropriate dose of BZD given, reassessment time after doses, incidence of alcohol withdrawal-related events, and incidence of BZD-related complications will also be evaluated.

RESULTS: Data collection was completed in December 2009 and data analysis is ongoing. Final results with conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Identify contraindications to use of a symptom-triggered protocol for AWS.

Recognize potential benefits of symptom-triggered treatment for AWS.

Self Assessment Questions:

What is a contraindication to the use of a symptom-triggered protocol for AWS?
a.Intubation
b.Non-verbal
c.Polysubstance withdrawal
d.Concurrent alcohol
e.All of the above

True/False. Decreasing amount of BZD used is a potential benefit of symptom-triggered treatment for AWS.

COST SAVINGS ASSOCIATED WITH CLINICAL PHARMACISTS INTERVENTIONS WITH THE IMPLEMENTATION OF A DOCUMENTATION SYSTEM

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Purpose: Documentation of pharmacist interventions call illustrate cost savings provided to an institution through pharmacist actions and help to validate the role and resources allocated for clinical pharmacist positions. Gundersen Lutheran Medical Center implemented an integrated electronic health record (EPIC) in November 2008. Prior to EPIC implementation, pharmacists did not have a consistent strategy or format with which to document intervention data. The objectives of this project are to identify the types of interventions being performed by clinical pharmacists at our institution and to develop a documentation system utilizing our current software program EPIC.
Methods: To serve as a baseline, intervention information from EPIC was collected over a four week period. A literature review was conducted to identify types of interventions performed by clinical pharmacists in the hospital setting and the cost savings associated with each type of intervention. Based on current literature, the data was categorized according to the type of intervention and given a monetary value for the cost savings associated with the intervention. EPIC was assessed for other potential means to document interventions and for capabilities to capture the data to make reports. The new documentation process selected was based on the ease of integration into the current workflow of clinical pharmacists and the ability to collect quality data. After the most ideal method was identified, staff was educated prior to implementation on appropriate use.
Data was then collected and evaluated post-implementation to depict the cost savings provided to the institution by clinical pharmacists through interventions.
Results and Conclusion: Further data collection and evaluation is currently in progress. Conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:

Recognize pharmacist activities and interventions that have associated cost savings reported in the literature.

Identify a process to document interventions made by pharmacists and how to translate them into cost savings.

Self Assessment Questions:

True or False: Interventions by clinical pharmacists provide institutions with cost savings.

Which of the following is not an intervention performed by pharmacists that is associated with cost savings?
a. Dosage adjustment for renal or hepatic clearance
b. Formulary conversion
c. Switch route of administration
d. None of the above

TOBRAMYCIN PHARMACOKINETICS IN PATIENTS WITH CYSTIC FIBROSIS BEFORE AND AFTER BILATERAL LUNG TRANSPLANTATION.

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Purpose: Individuals with cystic fibrosis (CF) demonstrate rapid clearance of aminoglycoside antibiotics compared to the average population. Following a bilateral lung transplant, the pharmacokinetics (PK) of aminoglycosides appear to change in these patients. This study compared the PK of tobramycin in patients with cystic fibrosis before and after bilateral lung transplantation.

Methods: Medical records of the 13 patients with CF who had received bilateral lung transplants at University of Kentucky HealthCare prior to August 2009 were reviewed. Tobramycin concentrations pre - and post - transplant were collected and used to compare PK parameters, including elimination rate constant (Ke), half - life (t1/2), volume of distribution (Vd), and area under the curve (AUC). Cumulative tobramycin doses to date, tacrolimus concentrations, serum creatinine, and diuretic use in the post - transplant period were collected to examine whether a correlation seemed to exist between these variables and PK changes. In addition, the duration and permanency of PK changes were evaluated to ascertain if there is a migration in kinetic parameters towards pre-transplant values over time.

Results: Preliminary data from seven patients indicate that the mean elimination rate constant decreased in the post - operative period, from 0.25 0.05 hr-1 to 0.16 0.09 hr-1, while the mean half - life increased from 2.9 0.7 hr to 8.0 8.7 hr. The mean volume of distribution increased from 0.33 0.09 L/kg to 0.44 0.18 L/kg, while the mean area under the curve increased from 110.2 32 mg L-1 hr to 160.7 23 mg L-1 hr. The mean tobramycin dose in the pre - transplant period was 10.1 1.4 mg/kg/day compared to 7.65 1.5 mg/kg/day in the post - transplant period.

Conclusions: Preliminary results indicate that tobramycin pharmacokinetics in patients with cystic fibrosis are altered after bilateral lung transplantation.

Learning Objectives:

Recognize that patients with cystic fibrosis demonstrate rapid clearance of aminoglycosides compared to the average population, and therefore require higher doses.

Describe apparent changes in tobramycin pharmacokinetics in patients with cystic fibrosis after undergoing a bilateral lung transplant.

Self Assessment Questions:

1.If a typical once - daily tobramycin dose is around 5 - 7 mg/kg/day, which of the following represents the tobramycin dose a patient with cystic fibrosis may require?
a.3 mg/kg/day
b.5 - 7 mg/kg/day
c.10 mg/kg/day

2.Based on initial research, after a patient with cystic fibrosis undergoes a bilateral lung transplant, the half - life of tobramycin seems to
a.Decrease
b.Remain the same
c.Increase

IDENTIFYING HEALTH-CARE ASSOCIATED INFECTIONS AFTER LIVER TRANSPLANT

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Purpose:
Liver transplant recipients are at an increased risk for health-care associated infections (HAI) and multi-drug resistant organisms (MDRO). With the development of sophisticated immunosuppressive regimens, patients have enjoyed improved graft survival at the expense of decreased immune protection against infectious organisms. This is an additional risk for HAI beyond those associated with hospitalization for surgical and medical issues. Despite efforts, resistance patterns for HAI continue to trend towards multi-drug resistance.
We suspect that there may be multiple unidentified risk factors for infection in general and specifically MDRO. The primary purpose of this study is to identify and characterize HAI by infection type and organisms including MDRO in the liver transplant population at Henry Ford Hospital over a two-year period. We also plan to determine the effect of re-operations on HAI and to determine risk factors for the development of HAI.

Methods:
The study is a nested case-control study in patients who received a liver transplant at Henry Ford Hospital during the two-year study period of April 1st 2007 to April 1st 2009. This is a retrospective chart review to identify the cohort of liver transplant patients based on ICD-9 code for liver transplant. Inclusion criteria include Transplant Day 0 between April 1, 2007 and April 1, 2009, single organ liver transplant and age over 18 years on day 0. Using microbiology data in patients electronic medical records, cases will be identified as patients who encountered a bacterial or fungal infection based on definitions recommended by the American Society of Transplantation. Data collection will include demographic data, past medical history, surgical and transplantation history, infection and antibiotic history, any other previous healthcare exposure and infection and culture data during the study period.

Results and Conclusions:
To be presented.

Learning Objectives:

Define multi-drug resistant organism.

Name a risk factor for health-care associated infections in liver transplant patients.

Self Assessment Questions:

What is a multi-drug resistant organism?

What is a risk factor for health-care associated infections in liver transplant patients?

SURVEY OF AMBULATORY INFUSION SERVICES IN THE DEPARTMENT OF VETERANS AFFAIRS

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PURPOSE:
The Veterans Affairs Ann Arbor Healthcare System provides selected ambulatory infusion services to their patient population. A recent study conducted at the Ann Arbor VA on their home infusion services showed safety and efficacy in their patient population. It is suspected that other VA Healthcare System locations may also be providing limited or expansive ambulatory infusion services, but no clear documentation exists. These services may include infusions provided in the home, contracted to the private sector, or those provided in an ambulatory clinic. The primary objectives of this study are to survey and collect information on the extent of involvement of Veterans Affairs healthcare systems in the provision of ambulatory infusion services, the number of patient days, indications for ambulatory infusions, practices for monitoring quality and outcomes, and reasons why services may not be provided; and to promote and facilitate VA healthcare systems interest and ability to provide ambulatory infusion services.

METHODS:
This prospective study consists of a multi-center electronic survey, hosted through SurveyMonkey.com, to determine how many VA healthcare systems including their outpatient or ambulatory care facilities provide ambulatory infusion services to their patients. Indications, cost savings, safety and efficacy, numbers of patient days, and reasons services may not be provided will be assessed. Chiefs of Pharmacy at 153 Veterans Affairs healthcare systems will receive an invitation through e-mail to take the algorithmic electronic survey. The Chief may allow another knowledgeable pharmacy staff member to complete the survey. The data analysis will report the percentages of facilities providing ambulatory infusion services in the home, through an ambulatory clinic setting, and/or those facilities that contract out services. A report will then be developed to inform the Department of Veterans Affairs of the results.

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

Learning Objectives:

State the Infectious Disease Society of America's definition of home infusion.

List limitations to providing ambulatory infusion services.

Self Assessment Questions:

True or False: The Infectious Disease Society of America defines home infusion as the provision of infusion services to patients for at least two doses on different days without going to a hospital for an overnight stay.

True of False: Financial constraints, lack of policies and procedures, and concerns of complying with USP 797 are limitations that may not allow an institution to provide ambulatory infusion services.

EVALUATION OF AN ENOXAPARIN DOSING PROTOCOL IN PATIENTS WITH MODERATE RENAL IMPAIRMENT FROM ANTI-XA LEVEL ANALYSIS

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Clinical trials and pharmacokinetic studies demonstrate that patients with renal dysfunction experience elevated anti-Xa levels using traditional doses of enoxaparin, representing excessive anticoagulation. A published dosing protocol for patients with moderate renal impairment (creatinine clearance [CrCl] 31-59 mL/min) utilizes enoxaparin 1 mg/kg subcutaneously (SQ) followed by 0.75 mg/kg SQ every 12 hours. This protocol has been shown to achieve therapeutic anti-Xa levels with 80 percent accuracy and was implemented as standard practice at the University of Chicago Medical Center (UCMC) in February 2009. The purpose of this study was to assess the efficacy of the new dosing protocol.

This retrospective cohort analysis evaluated patients with renal impairment who received twice daily treatment with enoxaparin. The primary endpoint was to assess the effectiveness of the UCMC protocol versus non-protocol dosing in achieving therapeutic anti-Xa levels (0.5 - 1.0 units/mL) for patients with moderate renal impairment. Secondary endpoints included evaluation of protocol adherence and patient characteristics impacting anti-Xa levels. Patients were identified with medication use reports and electronic medical record abstraction. Pregnancy and acute kidney dysfunction (defined as an increase in serum creatinine by 0.5 g/dL or over 50 percent from baseline) were exclusion criteria. Patient demographics and indication for anticoagulation were collected. The Cockcroft-Gault method using ideal body weight was applied to calculate CrCl. Patients with CrCl 31-59 mL/min were included if they received treatment doses of enoxaparin and had anti-Xa levels measured 3-5 hours after the third enoxaparin dose. Anti-Xa levels were categorized as subtherapeutic, therapeutic, or supratherapeutic. The study was designed to achieve 80 percent power with an a priori alpha = 0.05 to detect a 20 percent difference in the efficacy of protocol vs non-protocol dosing. One-way analysis of variance and Chi-square tests were used to assess the primary and secondary endpoints for each subgroup.

Results and conclusions will be presented.

Learning Objectives:

Evaluate primary literature warranting enoxaparin dose reduction in moderate renal impairment.

Assess enoxaparin protocol dosing and its efficacy in achieving therapeutic levels of anticoagulation.

Self Assessment Questions:

What are the primary factors influencing enoxaparin pharmacokinetics?

True or False: The enoxaparin package insert recommends dose adjustments when CrCl is ≤ 30mL/min, but no current literature supports additional dosing changes.

IMPROVED HEALTH OUTCOMES FROM A PHARMACIST DRIVEN WELLNESS CLINIC

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Background:
Current trends in healthcare are focused on preventative medicine offering savings in both cost and time for patients. Although agencies such as the U.S. Preventive Task Force (USPSTF) have developed recommendations on preventive services, a large portion of patients are not receiving the appropriate care from their primary care providers.

Objective:
To identify the key areas of focus for a pharmacist driven wellness clinic. The wellness clinic is intended to improve patient health and progress to the current standard of care for every patient.

Methods:
A needs assessment survey was provided to both employees of a private university and active patients of an internal medicine clinic. The results of the survey were utilized to establish a pharmacist driven wellness clinic in an internal medicine clinic. Survey questions focused on primary and secondary preventive services that are considered the standard of care for otherwise healthy individuals in the following areas: Smoking cessation, alcohol abuse, polypharmacy, immunization status, hypertension, dyslipidemia, osteoporosis, diabetes, and obesity.

Survey Results:
Identified areas of need for the wellness clinic were smoking cessation, polypharmacy, weight loss, immunization status, diabetes, hypertension, and dyslipidemia.

Conclusions:
Data collection in progress. Full results will be submitted to a peer reviewed journal for publication.

Learning Objectives:

Understand the process of establishing a wellness clinic

Indentify the benefits of pharmacist's presence on improved health outcomes in a wellness clinic

Self Assessment Questions:

True or False the number one problem in treating illness today is patients' failure to take prescription medications correctly, regardless of patient age.

At any given time, regardless of age, up to what percent of those on five or more medications are taking them improperly?

SAFETY AND EFFECTIVENESS OF INTRAVENOUS COLISTIMETHATE IN PATIENTS WITH CYSTIC FIBROSIS

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Purpose:
Colistimethate is an antimicrobial agent active against gram negative multidrug-resistant pathogens. The use of intravenous (IV) colistimethate has been infrequent due to nephrotoxicity and neurotoxicity reported in early studies. Increasing life expectancy among patients with cystic fibrosis (CF) correlates with an increased exposure to antibiotics over time. Therefore, multidrug-resistance against commonly used antibiotics (e.g. tobramycin) is a growing problem, and IV colistimethate is re-emerging as a treatment option. The purpose of this study was to evaluate the safety and effectiveness of IV colistimethate treatment in CF exacerbations, in order to better characterize optimal dosing and monitoring practices.

Methods:
A retrospective chart review was conducted including patients with CF admitted to Cincinnati Childrens Hospital Medical Center with acute pulmonary exacerbation, and treated with IV colistimethate or IV tobramycin between July 1, 2007 and January 31, 2010. Effectiveness of treatment with IV colistimethate was evaluated by analyzing changes in forced expiratory volume in one second (FEV1), as well as physician-reported symptom improvement. All adverse effects were evaluated in the IV colistimethate group, and the incidence of nephrotoxicity was extracted and compared to similar endpoints in the IV tobramycin group.

Results:
Thirty episodes of IV colistimethate use (mean age = 17.9 years [16-20]; mean baseline FEV1 = 58.5% [30-79]; mean baseline SCr = 0.63mg/dL [0.5-1]), and 30 episodes of IV tobramycin use (mean age = 13.6 years [2-20]; mean baseline FEV1 = 76.5% [34-119]; mean baseline SCr = 0.59mg/dL [0.31-1]) have been evaluated. Based on these data, the average change in FEV1 from admission to discharge in the colistimethate group was 12.6% (-3 to 30), and the incidences of nephrotoxicity and neurotoxicity were each 16.7% (5/30). No nephrotoxic episodes were reported in the control group based on study definitions. Final results and conclusions will be presented at the Great Lakes Conference.

Learning Objectives:

Describe potential adverse effects associated with IV colistimethate.

Identify the role of IV colistimethate in the treatment of pulmonary exacerbation in patients with cystic fibrosis.

Self Assessment Questions:

What is the most prevalent pathogen cultured from sputum in patients with cystic fibrosis who are over 18 years of age?

True/False: Colistimethate is a new agent developed in the last 5 years for the treatment of pulmonary exacerbation in patients with cystic fibrosis.

RETROSPECTIVE REVIEW OF OUTCOMES ASSOCIATED WITH A CLINICAL REMINDER FOR ATYPICAL ANTIPSYCHOTIC METABOLIC SYNDROME MONITORING

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BACKGROUND: Atypical antipsychotics have been associated with weight gain, diabetes, and dyslipidemia. Additionally, many patients who are treated with atypical antipsychotics may have increased risk for metabolic syndrome at baseline due to sedentary lifestyle. It is estimated that the prevalence of diabetes mellitus and obesity is approximately 1.5 to 2.0 times that of the general population in patients with schizophrenia and affective disorders. Therefore, it is imperative that clinicians monitor for metabolic changes in patients taking atypical antipsychotics to help reduce the long-term cardiovascular risks of diabetes and dyslipidemia.

OBJECTIVES: The purposes of this analysis are (1) to determine if patients with active atypical antipsychotic prescriptions are being monitored for metabolic complications in accordance with VA and APA guidelines using a new clinical reminder tool in the computerized patient record system; and (2) to determine whether compliance with the clinical reminder tool is similar for patients on low dose quetiapine (≤200mg) and all other atypical antipsychotics. Additionally, this analysis will compare rates of completion of the clinical reminder tool to prior methods of encouraging monitoring for metabolic complications.
METHODS: A retrospective chart review will be performed for all patients prescribed an atypical antipsychotic from 11/2008 to 11/2009. Data will be evaluated looking at low dose quetiapine versus all other atypical antipsychotics, including higher dose quetiapine. Approximately 800 charts will be reviewed to determine the timeliness of metabolic complication monitoring, including documented weight, BMI, fasting lipid panel, fasting blood glucose and hemoglobin A1c. Demographics including age, gender, ethnicity and past medical history of obesity, diabetes, dyslipidemia, or hypertension will also be collected. The frequency and accuracy of provider completion of the clinical reminder tool for metabolic monitoring will also be assessed. Compliance with the tool will be compared with prior methods of encouraging monitoring for metabolic complications.

RESULTS: pending

CONCLUSIONS: pending

Learning Objectives:

Explain the importance of monitoring for metabolic complications related to atypical antipsychotic medications.

Identify the health factors that should be monitored at baseline and periodically after starting an atypical antipsychotic.

Self Assessment Questions:

True or False - Patients prescribed atypical antipsychotic medications have risk similar to the general population for developing obesity, hyperlipidemia or diabetes.

True or False - Reviewing baseline weight, BMI, fasting lipid panel, fasting blood glucose and hemoglobin A1c prior to initiating an atypical antipsychotic medication is sufficient for monitoring for metabolic complications of the medication.

ASSESSMENT OF THE ACCURACY OF MEDICATION HISTORIES TAKEN UPON PATIENT ADMISSION TO SELECTED HOSPITALS WITHIN A HEALTH CARE SYSTEM

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Purpose:
National patient safety goals focus on accurate medication histories upon admission to hospitals by health care providers. Home medications are identified during an inpatient stay via a medication history and the medication reconciliation process. As health care systems transition to electronic home medication lists, it is imperative to have an accurate reflection of a patients medications upon admission to avoid errors, identify drug interactions, and reasons for admission. The objective of this project is to assess the accuracy of medication histories taken upon patient admission to hospitals within a health care system and to determine the best practice for performing medication histories.

Methods:
After submission to IRB, the project was considered exempt from oversight since it does not focus on human research. Four of the thirteen hospitals in the health care system, each with a different process, were selected to assess the accuracy of medication histories upon admission. Each hospital process for collecting medication histories was flowcharted to assess for variation. After the initial medication history had been performed, the investigator obtained a second medication history by re-interviewing the patient and follow-up discussions with retail pharmacies, as well as other sources when information was incomplete. The accuracy of each medication history obtained by the original caregiver compared to the investigator was assessed for correct drug, dose, route, and directions for use. Accuracy was reviewed for each medication line item and total overall accuracy of the medication history. After review of accuracy, a best practice for performing medication histories will be determined.

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

Learning Objectives:

Identify two different methods for collecting medication histories at various hospitals.

Identify two medication categories that were assessed for accuracy on the medication history.

Self Assessment Questions:

True or False. Nurses and pharmacy technicians are primarily the caregivers that initiated the medication history process.

List at least two medication categories that were evaluated for accuracy by the investigator.

EVALUATION OF METABOLIC PARAMETERS IN AN EARLY PSYCHOSIS PATIENT POPULATION

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BACKGROUND: Metabolic syndrome consists of several indices which place patients at increased risk of cardiovascular disease and diabetes. In 2003, the American Diabetes Association (ADA) and the American Psychiatric Association (APA) established consensus guidelines for metabolic monitoring in patients with schizophrenia. Since then, there have been several metabolic monitoring programs implemented throughout the country but very few in patients with early psychosis. More studies in patients with low lifetime antipsychotic burden are needed to determine whether the increased risk is due to genetics, environmental factors, or antipsychotic medications or a combination of factors.
METHODS: Participants will be adult patients from the Prevention and Recovery Center for Early Psychosis (PARC). Patients will be included in this study if they are receiving treatment at PARC between May 2009 and June 2010 and are ≥ 18 years of age. They will be excluded if they are pregnant or are a prisoner. Data collection will include demographic information, family/social history, concomitant medication use, metabolic parameters, and antipsychotic medication.
PRELIMINARY RESULTS: The mean age of our patient population was 22 years with a majority of patients being either Caucasian (52%) or African American (44%) and a diagnosis of either schizophrenia (42%) or psychosis NOS (38%). An interim analysis showed that from baseline to 3 months, 33% had increased waist circumference (n=3), 75% had weight gain (n=4), 60% had increased diastolic blood pressure (n=5), 100% had increased blood glucose (n=4), 50% had decreased HDL (n=4), 75% had increased triglycerides (n=4), 25% had increased total cholesterol (n=4), and 50% had increased LDL (n=4). Data collection and final analysis will be complete in March 2010.
CONCLUSIONS: Unable to draw conclusions as final data is still pending.

Learning Objectives:

List the criteria for metabolic syndrome

Describe the monitoring guidelines created by the American Diabetes Association and American Psychiatric Association

Self Assessment Questions:

Which of the following is NOT criteria for metabolic syndrome:
a.Waist circumference
b.Weight
c.Triglycerides
d.HDL

When should blood pressure be checked in a patient on an atypical antipsychotic medication?
a.Baseline, 1 month, and annually
b.Baseline, 2 months, and annually
c.Baseline, 3 months, and annually
d.Baseline, 4 months, and annually

TARGETED DISCHARGE COUNSELING OF PEDIATRIC PATIENTS WITH MULTIPLE MEDICATIONS

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Purpose: To identify pediatric patients ready for discharge with 5 or more medications and provide pharmacist-led discharge counseling. To assess the ability of parents to accurately measure doses, administer doses, identify medications, and recall medication information before and after counseling. To establish a collaborative between discharge planners, out-patient pharmacy, and in-patient pharmacists to improve patient care.
Methods: Nurses, discharge planners, physicians, and pediatric medical residents will enroll soon to discharge patients with 5 or more medications who may benefit from extensive counseling. The pharmacy resident is contacted by the enroller or on-campus out-patient pharmacy and a counseling session is arranged. Counseling occurs after 2:30pm to accommodate for resident obligations and to provide 24 hour notice to the family. Medication administration, storage, monitoring, and dosing will be discussed with parents and patients. Medication calendars and information sheets will draw attention to unique storage and acquisition requirements. Hands-on demonstration of injectable and oral syringe dosing and administration will be provided. Nursing staff will assess families using the interdisciplinary teaching sheet. Assessment is performed at the initiation of any medication order and again after counseling. All patients seen after October 1st will be evaluated for inclusion.
Results: Twenty patients have received discharge counseling through use of this program. Twelve families were reassessed by nursing staff at the time of discharge and all received the rating of "performs independently". Fourteen patients have a primary diagnosis of congenital heart defect. All twenty referrals have come from discharge planners.
Conclusion: The preliminary findings of this study have demonstrated that pharmacist-led discharge teaching can improve patient and parent medication knowledge and dosing technique. This project has a goal of 50 counseling events and will continue to recruit patients.

Learning Objectives:

List factors that complicate medication administration and dosing with pediatric patients.

Describe potentials for error when dealing with compounded medications

Self Assessment Questions:

True or False: Oseltamivir Liquid 5ml BID would be an appropriate medication order for a pediatric patient.

List 2 special considerations for dosing medications in infants and young children.

ANTICHOLINERGIC BURDEN OF OLDER ADULTS IN THE COMMUNITY

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PURPOSE:
Anticholinergic side effects are among the most common drug related problems in older adults living in the community and can lead to cognitive impairment and instability leading to falls. Studies have demonstrated anticholinergic activity in frequently-used medications not routinely recognized for anticholinergic adverse effects. Others have suggested that multiple medications with anticholinergic activity are additive in burden and increase the risk of side effects. Scales to quantify anticholinergic burden have been derived to assess the potential cumulative danger of medications with anticholinergic properties. The purpose of this research is to describe the anticholinergic burden in older adults in the community.

METHODS:
Methods consist of a retrospective cohort study of 450 patient records from comprehensive medication reviews collected during home visits by a pharmacist during the period between August 2002 and August 2009. Patients are included if they were 65 years of age or older at time of review. Exclusion criteria include age younger than 65 or incomplete records. Data collected consists of demographics, medications, chronic conditions and prescribers, medication coverage, and number of pharmacies used to fill prescriptions. Using the Anticholinergic Cognitive Burden (ACB) scale, scores will be calculated for each participant. Those ACB scores greater than or equal to 3 will be considered clinically significant. Results will be used to identify patient specific risk factors for predicting significant anticholinergic burden.

RESULTS:
Data collection and statistical analysis will be completed by April 2010. It is expected that many older adults will have a significant anticholinergic burden, including those on medications without recognized anticholinergic effects. The results of this study will be used to inform a prospective study to evaluate pharmacist-provided medication therapy management services as an appropriate and reproducible model to address this issue in older adults.

Learning Objectives:

To assess the frequency of anticholinergic burden in older adults in the community.

To identify risk factors in older adults that may contribute to anticholinergic burden.

Self Assessment Questions:

Anticholinergic drug exposure is an infrequent occurrence (<10%) in older adults in the community.

Risk factors to identify older adults at greatest risk for adverse events related to medications with anticholinergic properties are not well defined.

THE USE OF BIVALIRUDIN VERSUS HEPARIN IN PATIENTS UNDERGOING PERCUTANEOUS PERIPHERAL INTERVENTION

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PURPOSE: Bivalirudin is an anticoagulant that directly inhibits thrombin by binding to sites of circulating and clot-bound thrombin. It has fewer precautions and a better adverse reaction profile than heparin. Bivalirudin has been shown to have positive outcomes in percutaneous coronary intervention (PCI) versus heparin. However, bivalirudin has not been compared to heparin in percutaneous peripheral interventions (PPI). The objective of this study is to determine if there is a difference in the outcomes of using heparin versus bivalirudin in PPI.

METHODS: The Institutional Review Committee at Saint Joseph Hospital has approved this retrospective, single-center, parallel observation of drug usage and outcomes in peripheral intervention. All patients who underwent PPI at Saint Joseph Hospital and Saint Joseph East Hospital from 7/1/2008 to 7/1/2009 were screened to determine the use of bivalirudin or heparin during the PPI. Patients who received heparin as the sole anticoagulant will be selected then matched through pertinent patient characteristics to separate patients who received bivalirudin as the sole anticoagulant during their PPI. Patient data will be collected and analyzed to determine if there is a difference in the outcomes of using heparin versus bivalirudin in PPI. The Chi squared test and Fischers exact test will be used for categorical data where appropriate. The student T-test will be used for parametric data, while the Wilcoxon rank-sum test will be used for non-parametric data.

RESULTS: Data collection is in progress.

Learning Objectives:

Identify factors that increase risk for developing PAD.

Explain the rationale for use of bivalirudin in patients undergoing peripheral vascular procedures

Self Assessment Questions:

List four common risk factors for developing PAD.

T/F Bivalirudin is recommended for patients undergoing major vascular reconstruction procedures, such as peripheral vascular procedures according to CHEST guidelines.

A RETROSPECTIVE REVIEW COMPARING INCIDENCE OF POST-OPERATIVE ILEUS BEFORE AND AFTER IMPLEMENTATION OF ALVIMOPAN THERAPY AT A VA HOSPITAL

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Purpose: Post-operative ileus is a common complication that can occur following major abdominal surgeries. This process usually resolves within 3 to 5 days if uncomplicated by other factors. One such complicating factor is the use of opioid analgesics for the treatment of pain associated with the surgery. Alvimopan (Entereg) is a gastrointestinal-specific mu-opioid receptor antagonist that has been FDA approved to accelerate the time to GI recovery following partial large or small bowel resection with primary anastomosis.

Methods: A retrospective chart review of patients at the R.L. Roudebush VA Medical Center who underwent a partial colectomy with primary anastomosis was completed. Data collected from January 1, 2009 through June 30, 2009 evaluated patients receiving standard therapy before the use of alvimopan. A second cohort underwent chart-review between July 1, 2009 and December 31, 2009 to evaluate patients after the addition of alvimopan to perioperative care.

Preliminary Results: A total of 28 patients who underwent colorectal surgery with primary anastomosis were reviewed. Post-operative ileus occurred in 9 of 17 (52.9%) patients in the standard therapy group compared to 1 of 11 (9%) patients in the alvimopan group. The average time to first bowel movement was 4.5 days and 2.45 days in the standard therapy and alvimopan treatment groups respectively. The average length of stay was 13.75 days versus 6.27 days and the number of patients with readmissions or other complications related to surgery was 4 (24%) and 1 (9%). Average number of adverse events per patient in each treatment group were 1.875 and 1.27 comparatively. Data collection will continue until all qualifying patients are reviewed.

Conclusions: Data collection and evaluation are ongoing. Completed results and conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:

Define post-operative ileus as it relates to colorectal surgery patients and identify contributing factors that may lead to its formation

Identify the pharmacologic mechanism of action of Alvimopan and its recommended dose and duration

Self Assessment Questions:

Which of the following statements is FALSE?
A.Post-operative ileus is a common complication that can occur following major abdominal surgeries.
B.Without pharmacologic intervention post-operative ileus will NOT resolve spontaneously.
C.Post-operative ileus can lead to abdominal distress and distention, nausea, vomiting, and the inability to pass stool.
D.Factors influencing ileus formation include inflammatory response, inhibitory neural reflexes, and the secretion of endogenous opioids within the gastrointestinal tract.

Which of the following describes the maximum indicated dose and duration of Alvimopan?
A.One 12 mg capsule pre-operatively, followed by one capsule daily for up to 14 days
B.One 12 mg capsule pre-operatively, followed by one capsule twice daily for up to 14 days
C.One 12 mg capsule pre-operatively, followed by one capsule daily for up to 7 days
D.One 12 mg capsule pre-operatively, followed by one capsule twice daily for up to 7 days

THERAPEUTIC TROUGHS IN INDIVIDUALIZED VERSUS STANDARD DOSING OF VANCOMYCIN

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BACKGROUND:
Vancomycin has been an extensively studied antibiotic. Historically, appropriate dosing and monitoring methods have not been well-defined. More recently, there have been several publications addressing vancomycin use. Guidelines specifically published by the American Society of Health-System Pharmacists, the Infectious Diseases Society of America, and the Society of Infectious Diseases Pharmacists found that monitoring levels should be required to assess efficacy and prevent resistance. It has been found that subtherapeutic concentrations of vancomycin are associated with the development of intermediate-resistant organisms. These guidelines acknowledge different dosing strategies (1g or 15mg/kg per dose) used in the treatment of infections. However, they do not specify which method is more appropriate.

PURPOSE:
This study evaluates each strategy to determine if either method was more associated with having an initial target trough. The primary objective of this study is to determine the proportion of patients in each group (separated based on dosing strategy used) who attain an initial target trough after at least two doses. The secondary objectives include determining the proportion of patients in each group who attain an initial target trough before the fourth dose versus after the fourth dose, and verifying if dosing adjustments were made to attain target troughs.

METHODS:
This was a retrospective chart review conducted at Akron General Medical Center. The study included patients who received intravenous vancomycin in 2008 and were selected based on inclusion and exclusion criteria. Patients were then divided into two groups based on dosing strategy: individualized (15mg/kg/dose) and standard (1g every 12 or 24 hours). The vancomycin dosing regimen and trough levels were reviewed for each patient.

RESULTS:
Results and conclusions are to be presented at the conference.

Learning Objectives:

Determine if either of the dosing strategies attains the initial target trough.

Discuss if troughs drawn before and after steady state attains initial target trough.

Self Assessment Questions:

It is recommended that serum vancomycin concentrations be maintained above 10 mg/L to avoid development of resistance. True/False

Steady state of vancomycin occurs approximately before the third dose. True/False

IMPLEMENTATION AND EVALUATION OF A HEALTH LITERACY WORKSHOP FOR MEDICAL RESIDENTS

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Purpose: Functional health literacy is a public health issue affecting all patients regardless of age, race, or income level. The American Medical Association recommends developing education programs that train physicians to communicate with patients having limited health literacy skills; however, an optimal way to educate physicians on health literacy has yet to be determined. The primary objective is to estimate the effect of a health literacy workshop on medical residents ability to evaluate patient health literacy. Secondary objectives include assessing health literacy of an outpatient clinic population, determining the relationship, if any, between health literacy and medication adherence, and evaluating differences in adherence rates between self-reported and refill adherence in a population with limited health literacy.

Methods: Patients presenting to the St. Vincent Primary Care Center Internal Medicine clinic were evaluated. Following IRB approval, a prospective study design was used to evaluate the study objectives. Upon receiving informed consent, researchers collected patient demographics, assessed adherence and health literacy through standardized questioning, and recorded refill histories using pharmacy records for included patients. Following the patient - physician encounter, the medical resident was asked to evaluate the patients health literacy by answering the following question, "Do you feel your patient has a literacy problem?" Data collection took place one month prior and two months post health literacy workshop presented to Internal Medicine resident physicians. Patients without medications at the time of their visit, patients with cognitive impairment, and patients with primary language other than English or Spanish were excluded.

Results and Conclusions: Initial data collection is complete and analysis is currently in progress. Preliminary results show medical residents were "correct" in their assessment of patient literacy, when compared to the Newest Vital Sign (NVS) assessment, on 49 (47.1%) of the patients prior to the health literacy workshop. Further results and conclusions will be presented at the conference.

Learning Objectives:

Recognize the financial impact of limited health literacy.

Identify opportunities for pharmacy involvement in improving patient education in individuals with limited health literacy.

Self Assessment Questions:

Patients with limited health literacy lack the skills required to successfully navigate the health care system and are at higher risk for hospitalization. T or F

Pharmacy interventions to improve patient education include emphasizing the teach-back method, avoiding medical jargon, and repeating important "take - home" points. T or F

EVALUATING RISK FACTORS FOR THE DEVELOPMENT OF EXTENDED-SPECTRUM BETA-LACTAMASE PRODUCING INFECTIONS IN A VETERANS AFFAIRS MEDICAL CENTER

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Purpose. The objective of this study is to evaluate risk factors for the development of nosocomial and community-acquired ESBL-producing infections and assess effects on morbidity and mortality.

Methods. We performed a retrospective case-control study of patients who developed ESBL-producing infections from January 2007 through October 2009 at the Richard L. Roudebush Veterans Affairs Medical Center. Each case patient was matched with two control patients based on site of infection and organism species (non-ESBL producing). Data on demographic characteristics, infection site, microbiology, patient location, recent or current hospitalization, foreign body use, urologic manipulations, and cause of death was collected, analyzed, and compared between cases and controls.

Results. A total of 72 patients have been identified for inclusion. There are 24 case patients with ESBL-positive infections included. Case patients were than matched with a total of 48 control patients. Data collection is currently in progress with results pending.

Conclusions. The results of this study are pending finalization of data collection and statistical review.

Learning Objectives:

List currently identified risk factors for the development of ESBL-producing infections

Identify appropriate antimicrobials for the treatment of ESBL-producing infections

Self Assessment Questions:

Which of the follow antimicrobial is an appropriate first-line treatment option for a patient with a suspected ESBL-producing infection?

a. Imipenem/Cilastatin
b. Amoxicillin
c. Ciprofloxacin
d. Cefepime
e. Ceftriaxone

Which of the following antimicrobial(s) may be used as "salvage" therapy for the treatment of ESBL-producing infections?

a. Tigecycline
b. Trimethoprim/Sulfamethoxazole
c. Colistin
d. A and B
e. A and C

EVALUATION OF THE IMPACT OF CONSUMER MESSAGING ON MEDICATION TREATMENT PATTERNS

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Purpose:
To evaluate the proportion of members that convert to the recommended alternative medication and to evaluate therapy interruption, dosing, and conversion back to a brand medication.

Methods:
This analysis will include messaging to commercial and Medicare members taking brand statins, angiotensin-receptor blockers (ARBs), proton pump inhibitors (PPIs), and hypnotics during 2008. These members received a mailing recommending an alternative medication and were continuously enrolled for 12 months from the mailing date. A retrospective analysis using administrative pharmacy claims will be used to identify members that convert to the recommended alternative medication and to evaluate therapy interruption, dosing, and conversion back to a brand medication. Conversion will be identified by one claim for the alternative medication filled within 120 days of the mailing date. Therapy interruption will be defined as a gap between the last fill for the targeted medication and the first fill for the alternative. Of the members that converted, dosage comparisons will be performed to determine if the member was converted to an equivalent dose. Members who converted to a brand medication within 180 days after the initial switch will be assessed. A subanalysis of Medicare members that switched to an alternative will be evaluated to determine if their coverage phase (pre-coverage gap, coverage gap, catastrophic coverage) impacted when the member switched to the alternative.

Results:
A preliminary analysis identified that more than 1.2 million (1,212,034) unique members received a mailing in 2008 for one of the targeted medications. The majority (59%) of members were targeted more than once during 2008. Of the total mailings, 65% targeted statins followed by 30% ARBs, 3% PPIs, and 2% hypnotics.

Conclusions: The results of this study will be used to evaluate and promote appropriate consumer messaging within a health plan population.

Learning Objectives:

Discuss treatment patterns of physicians and the utilization patterns of members who switched to a lower cost alternative based on a letter campaign.

Recognize the proportion of members that convert to the recommended alternative medication and to evaluate therapy interruption, dosing, and conversion back to a brand medication.

Self Assessment Questions:

Name ONE of the most important concerns to members regarding switching to a generic medication?

When is the most effective time to contact a member regarding switching to a generic medication?

DEVELOPMENT AND IMPLEMENTATION OF AN ANNUAL CODE BLUE PHARMACY COMPETENCY: EVALUATING ADHERENCE TO ACLS GUIDELINES AND IMPROVING SELF ASSESSMENT AND COMPETENCY BASED KNOWLEDGE

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Each year hundreds of thousands of patients across the country suffer an in-hospital Code Blue event. Patients who experience a cardiac-arrest in the hospital have survival rates of 10-25% before being discharged. Pharmacists at Mount Carmel West play an important role in the management of medications during these medical emergencies. Pharmacist participation improves patient mortality by decreasing adverse events, providing appropriate drug information, calculating dosages, and preparing medications. Currently at Mount Carmel West a pharmacist responds to every Code Blue situation, however there is no formal process of certification for these pharmacists. There is also no national pharmacy certification program formally set up to train pharmacists responding to a Code Blue event.
During 2009 there were a total of 132 Code Blue emergencies on 118 patients with a survival rate of 66% at Mount Carmel West. The Code Blue Review Committee identified 62 possible deviations from the ACLS guidelines. After reviewing the documented resuscitation record there were 39, or 63%, of deviations that had the potential to be prevented by pharmacist intervention. Therefore, this information indicates there is definitely room for improvement of patient care during these life or death situations after proper education and implementation of pharmacy competencies. The primary objective is to determine if there is a reduction in number of pharmacy preventable deviations from ACLS guidelines following education.
The secondary endpoint is to evaluate the effectiveness of an educational intervention for pharmacists competency in Code Blue situations.

Learning Objectives:

To define the role of the pharmacist during Code Blue emergencies

To outline the current deviations at Mount Carmel West and the steps taken to reduce future deviations from ACLS guidelines

Self Assessment Questions:

What is an example of an effective approach to furthering knowledge and application related to medications given in a code blue situation?

What is the normal dose of atropine for a patient with a pulse and a systolic blood pressure of 40?

EFFECT OF THERAPEUTIC SUBSTITUTION OF HOME MEDICATIONS ON ACCURACY OF DISCHARGE MEDICATION RECONCILIATION

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PURPOSE

The objective of this study is to determine the effect therapeutic substitution of home medications has on the accuracy of discharge medication reconciliation, and to identify factors that may lead to errors during the discharge medication reconciliation process. At Community Health Network, non-formulary home medications may be automatically therapeutically substituted to a formulary drug with the intention that these medications will be converted back to the original agent during discharge medication reconciliation. Failure to prescribe only the original medication at discharge may lead to adverse effects, increased expenses, and/or injury to the patient.

METHODS

This study will include 200 patients who received a formulary alternative for a home medication while hospitalized at The Indiana Heart Hospital or Community Hospital North between July 1st and September 30th of 2008 or the same three-month period of 2009. Patients must be between the ages of 18 and 89 at the time of admission for inclusion in this study, while maternity and psychiatric patients will be excluded. The following formulary drugs will be investigated: losartan, beclomethasone inhaler, simvastatin, hydrochlorothiazide, bupropion SR, tolterodine SR, and Tricor. Pertinent information will be derived from patients electronic medication records, including the names of admitting and discharging physicians, presence or absence of a note in the medication administration record indicating that drug is a substitute for a home medication, year of hospitalization, location of hospitalization, and physician or nursing documentation indicating what medications patients were prescribed at discharge.

RESULTS/CONCLUSION

Data collection in progress

Learning Objectives:

Discuss the effect of therapeutic substitution of home medications on accuracy of discharge medication reconciliation

Identify factors contributing to errors during discharge medication reconciliation

Self Assessment Questions:

Name an organization that emphasizes the importance of medication reconciliations role in enhancing patient safety.

Describe at least two strategies to prevent errors during discharge medication reconciliation.

REVIEW OF A PEDIATRIC DOSE CHECK PROTOCOL AT THREE COMMUNITY PHARMACIES

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This study will determine if the pediatric dose check protocol from three independently owned community pharmacies participating in the Wisconsin Pharmacy Quality Collaborative (WPQC) complies with guidelines for preventing medication errors in pediatric patients, if it prevents dosing errors in this population, and whether prescribers and patients parents are satisfied with the service.

This dose check protocol was compared to published guidelines from national organizations. Pharmacists were interviewed to assess understanding of protocol requirements. Data was collected from pediatric prescriptions from January 1 through June 30, 2009 to determine the effectiveness of the protocol. Data collected included patient age, weight, therapeutic class of medication, whether dose calculation was documented, whether the prescribed dose and duration was appropriate, whether the dispensed dose was appropriate, and if communication with parents or prescribers was documented. Prescribers were mailed anonymous 10-question surveys during January and February, 2010. Patients were offered anonymous 5-question surveys throughout the month of January, 2010.

This dose check protocol satisfies 73% of published standards. However, none of these guidelines are specific to the community pharmacy setting. Pharmacist interviews will take place throughout the month of February. A list of relevant pediatric prescriptions was compiled and each prescription is being analyzed individually for dosing errors and pharmacist actions. As of January 22th 7 prescriber surveys and 59 patient surveys have been collected.

The use of a specific protocol to ensure pediatric dose checks are performed by a verifying pharmacist has several positive effects. This is an important step not only to pediatric patients caregivers but also to prescribers. Therefore it is recommended that community pharmacies adopt a standardized process for the verification of pediatric prescriptions.

Learning Objectives:

Discuss the usefulness of and responses to the pediatric dose check protocol used at three independently-owned community pharmacies.

Identify three important components of this protocol that can be applied to any pharmacy setting.

Self Assessment Questions:

1. Which of the following aspects of the pediatric dose check protocol used at Marshland Pharmacies Inc. can also be used at other pharmacies?
a) Pharmacists are trained on the steps of checking a pediatric prescription
b) Dose check reference cards are given to pharmacists
c) Online medication resources are made available for use by pharmacists
d) Instructions for using oral syringes or other medication delivery devices are given to parents or caregivers
e) All of the above

2. Pharmacist: "Hello Mrs. Jones. We have a new prescription for your son. Can I ask how much he weighs?"
Mrs. Jones: "Twenty-five pounds."
Pharmacist: "Thank you. The prescription for your sons antibiotic is not ready quite yet because I have to check the dose. It will only be a few minutes"
Mrs. Jones: "What? I left the doctors office thirty minutes ago and they said it would be ready when I got here."
What could the pharmacist have done to prevent this problem? Select the best answer from the options below.
a)Not checked the dose of the medication
b)Performed a back-calculation of the dose
c)Called the prescribers office for the patients weight

DEVELOPMENT, IMPLEMENTATION AND ASSESSMENT OF A NEW INPATIENT PHARMACIST STAFFING MODEL AT AN ACADEMIC MEDICAL CENTER

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Purpose:
To further the goal of being an employer of choice through an inpatient pharmacist staffing model that maximizes pharmacist retention, recruitment and engagement.

Objectives:
To develop, implement and assess an inpatient pharmacist staffing model that maximizes recruitment, retention, work-life balance, engagement, student/resident teaching, clinical practice, and scholarly activity.

Methods:
First, a literature search was performed to identify alternative peer institutions staffing model alternatives. Next, pharmacist perceptions of the current staffing model were gathered via one-on-one interviews, an electronic survey and the development of a staffing model redesign workgroup. Then, workload data (e.g. unit census, order volume) were collected and analyzed to assist in decisions regarding shift time, coverage areas and pharmacist responsibilities. Just prior to and again eight weeks after implementation, a satisfaction/engagement survey was administered and work sampling time studies were performed. During the time studies, the decentral pharmacists were paged and asked to document their current activity (e.g. participation in interdisciplinary patient rounds, patient teaching, travel from unit to unit). The pharmacists were randomly paged, on average, every thirty minutes from the hours of 0630 to 2300 for eight days prior to, and after staffing model changes. Afterwards, all the data points were aggregated to estimate the approximate time spent on each activity. Regarding pharmacist satisfaction and engagement, scores were assessed via an anonymous, electronic survey. Additionally, work-life balance was assessed through calculation of average shift start and end times, average of weekend and evening hours and change in shift length before and after model changes. Resident and student teaching, clinical practice and scholarly activity were assessed through shift overlap and estimates from work sampling. Next, clinical practice was assessed via time studies. Lastly, recruitment will be assessed through a survey of newly hired staff and retention will be assessed from staff turnover.

Learning Objectives:

To review methods for obtaining input from staff prior to development of a new inpatient pharmacist staffing model.

To discuss a potential technique for assessing pharmacist work activities.

Self Assessment Questions:

What are some methods of obtaining staff feed back prior to development of a new inpatient pharmacist staffing model?

True or False: Work sampling is an effective technique for assessing pharmacist activities when direct observation is not possible or rational.

EVALUATION OF NICARDIPINE VERSUS LABETALOL FOR BLOOD PRESSURE IN SUBARACHNOID HEMORRHAGE

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Purpose: The American Heart Association/American Stroke Association guidelines for management of aneurysmal subarachnoid hemorrhage (SAH) recommend blood pressure control, utilizing labetalol or nicardipine, but do not differentiate efficacy between the two agents. The purpose of this study was to compare BP control between labetalol and nicardipine in patients following aneurysmal SAH.

Methods: Consecutive adult patients admitted to the ICU with a diagnosis of SAH treated with labetalol or nicardipine were retrospectively identified. Patients were included if they received more than one dose of labetalol or a nicardipine infusion for greater than three hours. Patients were excluded if they were <18 years of age, experiencing a non-aneurysmal intracranial hemorrhage, acute ischemic stroke or a transient ischemic attack. Patients were stratified into two groups (labetalol vs. nicardipine) and data was collected for 72 hours. The outcomes compared were time within goal MAP, average MAP/patient, MAP variability, and treatment failure. Goal MAP was defined as 70-110mmHg. MAP variability was defined using the standard deviation of the mean for all MAP values/patient during treatment. Treatment failure was defined as a change to an alternative agent or MAP that was never within goal.

Preliminary Results: To date, 76 patients have been evaluated (labetalol, n=30; nicardipine, n=46). Demographics were similar between the two cohorts. There was no difference in MAP at baseline (11416 vs. 11516 mmHg, p=.786) between labetalol and nicardipine groups, respectively. There was no difference in time within goal BP (7426% vs. 7924%, p=.331), the average MAP (9712 vs. 9712 mmHg, p=.964), or MAP variability (1622 vs. 125 mmHg, p=.633) between labetalol and nicardipine groups, respectively. Treatment failure was higher with labetalol 2745%, 00%, (p<0.001).

Preliminary Conclusion: Although there was no difference between BP values, labetalol was associated with more treatment failure. Nicardipine is preferred over labetalol for treatment of hypertension in SAH.

Learning Objectives:

Explain the importance of appropriate blood pressure control in patients with SAH.

Identify typical signs and symptoms for patients experiencing a SAH.

Self Assessment Questions:

Which are the three blood pressure medications recommend for use in SAH by the AHA/ASA?
a)Nicardipine
b)Esmolol
c)Labetalol
d)a,c
e)a,b,c

Severe headache is not a typical presentation for SAH?
T or F

AN EVALUATION OF THE EFFECTIVENESS AND SAFETY OF VARENICLINE IN A VETERAN POPULATION

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BACKGROUND

Varenicline is a partial α4β2 nicotinic acetylcholine receptor agonist that in premarketing trials demonstrated efficacy as a smoking cessation treatment. These trials, however, had extensive exclusion criteria, such as patients with a variety of psychiatric disorders and/or any clinically significant or unstable cardiovascular or medical disease. This likely would have excluded many patients in our veteran population. After its approval, reports of serious neuropsychiatric symptoms, including suicidal ideation and behavior, in patients both with and without preexisting mental illness, emerged and resulted in the addition of a black box warning to varenicline's prescribing information. Currently, there is a lack of data investigating the use of varenicline in the veteran population. There has been only one published study on the use of varenicline in veterans. This study looked at a small number of patients, assessed only short-term abstinence rates, and only briefly discussed safety parameters.

PURPOSE

The purpose of this study is to evaluate the effectiveness, both at the end-of-treatment and long-term, and the safety of varenicline in a veteran population.

METHODS

This study is a retrospective, electronic chart review of patients at Jesse Brown VA Medical Center 18 years or older with a prescription for varenicline initiated between May 10, 2006 and June 30, 2009. There are no set exclusion criteria. Data collection includes characteristics, effectiveness, and adverse events of varenicline therapy as well as details of smoking and psychiatric history. The primary endpoints of the study are continuous abstinence rate for the last four weeks of treatment, quit rate at the end of treatment, and overall incidence of adverse events. The secondary endpoints are average length of varenicline therapy, length of abstinence after completing treatment, and the classification and severity of adverse events.

RESULTS/CONCLUSIONS

Data collection and analysis are ongoing. Results will be presented at the conference.

Learning Objectives:

Describe smoking cessation rates with the use of varenicline in a veteran population.

Identify the occurrence and severity of adverse events in patients treated with varenicline.

Self Assessment Questions:

True or False. A preexisting mental illness is an absolute contraindication to varenicline use.

Which of the following medications is/are FDA-approved for smoking cessation assistance?
a) Varenicline
b) Sertraline
c) Bupropion
d) A and C
e) All of the above

RETROSPECTIVE COHORT OF EXTENDED-INFUSION PIPERACILLIN/TAZOBACTAM (RECEIPT): A MULTICENTER STUDY

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Purpose: As suggested by Lodise in 2004, extending the length of infusion of piperacillin/tazobactam maximizes the time free drug is available at concentrations in excess of the MIC (fT > MIC) without the notable line access drawbacks of continuous infusions. Lodise and colleagues showed extended-infusion piperacillin/tazobactam improves 14 day mortality and length of stay in patients with Pseudomonas aeruginosa infections and APACHE II scores of ≥17. A multisite, retrospective cohort study compared extended-infusion piperacillin/tazobactam to intermittent infusion piperacillin/tazobactam in documented gram negative infections, but found no impact on 30 day mortality or length of stay. However, some limitations within these previous studies have led to the need to further characterize the effects of extended infusion on mortality, length of stay, and intensive care unit (ICU) length of stay and to describe the patient population which benefits most from extended-infusion administration. By using multiple study sites, this study aims to increase the power to detect a mortality benefit proposed by the Lodise study. The primary objective of this study is to compare the efficacy of extended-infusion piperacillin/tazobactam against alternative effective therapies using mortality as a primary endpoint.

Methods: A multicenter, retrospective chart review study was conducted in which each corresponding author conducted independent reviews of adult patients treated with extended-infusion piperacillin/tazobactam or intermittent-infusions of cefepime, imipenem/cilistatin, meropenem, doripenem, or piperacillin/tazobactam for more than 48 hours for any infection in which a gram negative organism is identified as the causative pathogen. Excluded were patients who received greater than 24 hours of effective antibiotics before the initiation of study drug, patients whose infection were proven resistant to empiric therapy, or any patient inadequately treated for a concurrent resistant pathogen. Mortality data will be presented using Kaplan-Meier survival curves to demonstrate mortality differences between groups.

Results and conclusions: To be presented at the conference.

Learning Objectives:

Describe the relationship between the pharmacodynamics of piperacillin/tazobactam and the utility of extended infusion.

Identify the type of patients who have shown benefit with extended infusion piperacillin/tazobactam in previous trials.

Self Assessment Questions:

Which type of pharmacodynamics best describes piperacillin/tazobactam?
A. Concentration dependent pharmacodynamics
B. Concentration independent pharmacodynamics

Which patient population has shown benefit with extended infusion piperacillin/tazobactam in previous literature (i.e., Lodise 2007)?
A. Patients infected with any gram negative organism at any MIC or APACHE II score
B. Patients with Pseudomonas aeruginosa infections at any MIC or APACHE II score
C.Patients with Pseudomonas aeruginosa infections with elevated MIC and any APACHE II score
D. Patients with Pseudomonas aeruginosa infections with elevated APACHE II score at any MIC

ASSESSMENT OF A LOW-DOSE HEPARIN PROTOCOL IN PATIENTS WITH A HIGH RISK OF BLEEDING

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Purpose:
Heparin is generally contraindicated in patients with active bleeding, severe thrombocytopenia, and when appropriate monitoring is not feasible. Some patients at high risk of bleeding still need to be anticoagulated when the risk of thrombosis outweighs the risk of bleeding such as during an acute pulmonary embolism. There is minimal evidence to guide the management of these patients. The purpose of this study is to validate a low-dose heparin protocol that can be used in patients with high risk for bleeding.

Study Objectives:
Evaluate the ability of low-dose heparin protocol to maintain activated partial thromboplastin time (aPTT) within desired range
Determine the incidence of major bleeding events while patients are being anticoagulated
Determine the incidence of minor bleeding events while patients are being anticoagulated
Determine the occurrence of thromboembolic events while receiving anticoagulation

Methods:
This is a prospective observational study of all adult patients requiring heparin administration per the low-dose heparin protocol between February 1, 2010 and February 1, 2011. Patients were classified as having a high bleeding risk if their platelet count was ≥ 40 Th/mm3 ≤ 60 Th/mm3, platelet count < 40 Th/mm3 if patient was receiving platelet therapy, neurosurgery within 7 days, or at the physicians discretion with approval by the department chair or department of hematology. Patients were identified by the pharmacy database and cross-referenced with the pharmacists anticoagulation monitoring forms to identify all patients on the low-dose protocol. Any bleeding or thromboembolic events were documented along with the current infusion rate and aPTT level. Dose adjustments were monitored to assess the effectiveness of the protocol to reach and maintain the target levels (aPTT 50-70 sec).

Results: Data collection and evaluation are ongoing and will be presented at the Great Lakes Regional Pharmacy Conference.

Learning Objectives:

Review different dosing nomograms for heparin

Discuss the need for anticoagulation in high-risk patients versus low-risk patients

Self Assessment Questions:

What are indications for heparin use?

List 3 criteria that qualify a patient for a low-dose protocol.

ATORVASTATIN 80 MG DAILY THERAPY FOR ACUTE CORONARY SYNDROME: AN ASSESSMENT OF SHORT AND LONG TERM TOLERABILITY

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Purpose: HMG-CoA reductase inhibitors, referred to as statins, lower serum cholesterol and reduce cardiovascular events in patients with coronary heart disease.1 Atorvastatin 80 mg daily is routinely initiated in acute coronary syndrome (ACS) patients discharged from University of Toledo Medical Center (UTMC). This practice is based on the Pravastatin or Atorvastatin Evaluation and Infection Therapy-Thrombolysis in Myocardial Infarction 22 (PROVE-IT-TIMI 22) trial which demonstrated that an intensive lipid-lowering regimen with high-dose statin therapy (atorvastatin 80 mg) significantly reduces cardiovascular risk by 16 percent after acute coronary syndrome (ACS) compared to moderate lipid-lowering with standard dose therapy (pravastatin 40 mg).2 The objective of this study is to assess use and tolerance of atorvastatin 80 mg daily in ACS patients. Specifically, if a dosage adjustment or therapy discontinuance has occurred during follow-up consultation and the documented reason for a therapy change.

Methodology: A retrospective chart review of adult patients admitted with a diagnosis of ACS discharged on a statin from UTMC during September 1, 2005 to August 31, 2009 and follow-up with UTMC Cardiology Clinic will be included in the study. Subjects will be evaluated for up to 36 months following discharge. The following data will be collected: patient demographics, type of ACS (NSTEMI, STEMI, or unstable angina), past medical history, home and discharge medications, laboratory values (liver function tests, creatine phosphokinase, serum creatinine, and lipid panel). Data collected from follow-up visits will include medication changes, current statin type and dose, and any adverse events or intolerances. Data will be collected on a data collection form using Microsoft Access and analyzed using Microsoft Excel.

Results and conclusions: Results will be presented at the residency conference.

Learning Objectives:

1)Describe the benefits of intensive dose statin therapy in acute coronary syndromes.

2)Discuss the disadvantages associated with long-term intensive dose statin therapy and identify patient-specific risk factors for adverse events.

Self Assessment Questions:

1)Which of the following is not an adverse event associated with intensive dose statin therapy?
a.Rhabdomyolysis
b.Increased risk of bleeding
c.Increases in liver enzymes
d.Increases in creatine kinase levels

2)The NCEP current guidelines for acute coronary syndrome patients based on recent clinical trials, including the PROVE-IT TIMI 22 trial, recommend:
a.LDL goal of < 150 mg/dl and < 100 mg/dl in high risk patients
b.LDL goal of < 100 mg/dl and an option of < 70 mg/dl in high risk patients
c.LDL goal of < 100 mg/dl in all patients, regardless of risk
d.LDL goal of < 70 mg/dl in all patients, regardless of risk