SURGICAL ANTIMICROBIAL PROPHYLAXIS IN COMMUNITY TEACHING HOSPITAL

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According to the ASHP Health-System Pharmacy 2015 Initiative, one of the objectives to accomplish by 2015 would be that 90% of hospital pharmacies ensure appropriate duration of antibiotic prophylaxis following surgical procedures. Postoperative infections can be a complication in surgery hence making antibiotic prophylaxis a very important factor of surgical care. The challenge however is the potential for antibiotic resistance and unnecessary costs resulting from factors such as selection of antibiotic, timing of administration and duration of antimicrobial prophylaxis. The purpose of this study is to determine the prescribing patterns of our surgeons, and adherence to accepted guidelines of antimicrobial prophylaxis in surgery.

Trover Foundation Regional Medical Center is a 410 bed hospital that performs an average of 450 surgeries monthly. This retrospective study will examine data collected from the charts of surgical patients from January 2005 till March 2005. Data collection will include the type of procedure, antibiotic selection, timing of pre-op antibiotic administration, dose, duration of surgery and re-administration, and duration of post antibiotic prophylaxis.

Results will be presented to the institution's surgical committee and processes for improvement will be recommended as needed.

Learning Objectives:

1) To determine the incidence of appropriate antibiotic prophylaxis in surgical patients at the Regional Medical Center.

2) To be able to discuss and promote the guidelines on antimicrobial prophylaxis in surgery.

Self Assessment Questions:

1) Single dose prophylaxis is effective for some surgeries.T or F

2) Post-Antimicrobial prophylaxis always has to be discontinued within 24 hours after surgery. T or F

COMPARISON OF PATIENTS PRESCRIBED MONOTHERAPY ATYPICAL ANTIPSYCHOTICS VERSUS MULTIPLE ATYPICAL ANTIPSYCHOTICS

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Background:
The introduction of atypical antipsychotics in the 1990's has changed how psychotic illnesses are treated. Although this new class of medications has similar efficacy compared to conventional antipsychotics, the atypical antipsychotics have an improved safety profile thus making them the first-line treatment choice. Recently, the use of multiple atypical antipsychotics has come into practice. However, there is limited evidence available in the literature concerning the issue of polypharmacy as applied to atypical antipsychotics.

Purpose:
The purpose of this observational study is to examine atypical antipsychotic use and polypharmacy in patients in a specific region of the Veterans' Administration Network.

Methods:
A database was created for the region to collect data for an atypical antipsychotic medication use evaluation (MUE). These data were collected from July 2003-September 2003. Patients were included if they were over the age of 18 and were receiving more than one atypical antipsychotic during that time period, as determined by outpatient prescription refill records. There were 243 patients that met the criteria. This observational study will utilize this database as well as identify a control group of patients from the same region through DSS Pharmacy data available, at the Austin Automation Center. We will identify a random sample from the Austin Automation Center database of 729 patients that were treated with a single atypical antipsychotic during 4th quarter of fiscal year 2003.

Patient demographics including age, gender, diagnoses, and Global Assessment of Functioning scores will be collected. For patients receiving multiple atypical antipsychotics, the rationale for combination therapy will also be extracted. Atypical antipsychotic names and doses will be included in the evaluations. The data from both groups will be compared to determine any differences between the groups.

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

Learning Objectives:

Describe the prevalence of multiple atypical antipsychotic use in a VA regional setting.

Explore the possible strategies for management of polypharmacy with atypical antipsychotics.

Self Assessment Questions:

There is literature to support the use of multiple atypical antipsychotics in patients. T/F

Atypical antipsychotics are as effective as conventional antipsychotics but have a better side effect profile. T/F

EVALUATION OF CURRENT HOSPITAL ACQUIRED PNEUMONIA PRACTICE BEHAVIORS

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The optimal duration of antibacterial treatment for pneumonia is unknown and is a highly debatable subject. Publication of recent data describing similar outcomes in patients with ventilator associated pneumonia (VAP) treated for eight days compared to fifteen days prompted an evaluation of current practice behaviors in treatment of hospital acquired pneumonia (HAP) at our institution. In addition to treatment duration, other factors previously shown to effect outcomes are time to initiation of antibiotics and use of appropriate empiric antibiotic therapy. Not surprisingly literature suggests that patients treated sooner after diagnosis with appropriate antibiotics have better outcomes. With the increasing emergence of multi-resistant bacteria it was also of interest whether the physicians at our institution were narrowing antibiotic therapy when culture data was present. The concern of undertreatment of patients, both from a perspective of antibiotic spectrum as well as duration of treatment, needs to be balanced against the threat of inducing multi-drug resistant microorganisms.

A retrospective chart review was performed on adult patients evaluated for VAP from October 1, 2004 through December 31, 2004. Patients were identified from a list generated by the infection control department used to evaluate of VAP. Subjects were included if they had a confirmed diagnosis of pneumonia and were between the ages of 18 and 89. Subjects were excluded for any preexisting extrapulmonary infection. The primary objectives of this portion of the study were to evaluate if receipt of appropriate empiric therapy had effects on patient outcomes such as mortality or ventilator days, and whether narrowing antibiotic spectrum based on culture data had effects on emergence of multi-resistant bacteria. Additional data not presented here includes the evaluation of outcomes in patients treated for a shorter duration versus a more traditional length of time.

Results are pending on the completion of data collection.

Learning Objectives:

Describe the rationale for narrowing antimicrobial spectrum of activity when culture data is available.

Discuss the implications of starting patients on inappropriate empiric antibiotic therapy for hospital acquired pneumonia.

Self Assessment Questions:

Development of multi-drug resistant organisms is more common with a narrow spectrum antibiotic.
T or F

Patients empirically started on inappropriate antibiotics are more likely to have a clinical cure.
T or F

USE OF LMWH DURING PREGNANCY: A RETROSPECTIVE REVIEW

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Venous thrombosis (DVT) and pulmonary embolisms (PE) are important causes of maternal morbidity and mortality. Several factors may contribute to the development of venous thromboembolism during pregnancy including venous stasis and underlying thrombophilic disorders such as factor V Leiden mutation, deficiency of antithrombin, Protein C and S deficiencies, and the presence of anti-phospholipid antibodies. During pregnancy, anticoagulation therapy poses a dilemma as optimal treatment for the mother is in conflict with optimal treatment for the fetus. Warfarin is usually avoided because it crosses the placenta and can cause teratogenicity and fetal bleeding. Therefore, unfractionated heparin and low molecular weight heparin (LMWH) have become the cornerstones of initial therapy as they are found to be safe for the fetus. While dosing recommendations for the use of LMWH in pregnancy are fairly well defined, monitoring guidelines for safety and efficacy are still needed.
This study is a retrospective chart review of patients who had LMWH therapy during their pregnancy and through 6 weeks post partum. The study group will be composed of pregnant women who were referred to the UIC Antithrombosis Clinic to receive LMWH therapy between January 1, 1998 – October 1, 2004. The study will evaluate LMWH dosing requirements throughout pregnancy, monitoring parameters, efficacy, and safety; measured by the evaluation of thromboembolic events, bleeding complications, and corresponding Anti-Xa levels. This retrospective study will help to gain more insight on LMWH use in pregnancy including the use of anti-Xa monitoring with regard to recommended frequency, expected changes in dose, expected side effect profiles and thromboembolic complication rates.

Learning Objectives:

To evaluate the efficacy and safety of LMWH use in pregnancy
To discuss the use of monitoring parameters to help recommend LMWH dosage changes

To evaluate the efficacy and safety of LMWH use in pregnancy
To discuss the use of monitoring parameters to help recommend LMWH dosage changes

Self Assessment Questions:

LMWH use during pregnancy is generally safe and effective. T or F

Monitoring parameters can be effectively used to adjust LMWH dosing. T or F

SAFETY AND EFFICACY OF A WEIGHT-BASED HEPARIN PROTOCOL IN OBESE PATIENTS

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PURPOSE: To evaluate the safety and efficacy of high-intensity weight-based heparin in obese patients through the assessment of aPTT goal endpoints and the avoidance of adverse events (AE).

METHODS: A retrospective and concurrent review of patient charts and laboratory data was conducted from January through December 2004. Patients hospitalized January through August were retrospectively identified by a discharge diagnosis code of DVT or PE. Concurrently, patients were identified by a report, which listed patients receiving heparin. Patients were included if they received high-intensity weight-based heparin (80 units/kg bolus and 18 units/kg/hour; aPTT goal range of 60-85 seconds). Patient data, including medical record number, age, height, weight, gender, indication, co-morbidities, medications, AE, and laboratory data (aPTT, INR, hemoglobin, platelets, and serum creatinine) were collected and entered into a Microsoft Excel database for analysis. The primary objectives were establishing the safety and efficacy of weight-based heparin in obese patients. Safety was assessed through evaluation of AE. Efficacy was assessed through analyzing the time taken until a therapeutic aPTT was achieved and aPTT levels at 6, 24, and 48 hours post-heparin bolus. Secondary objectives included assessing trends in the safety and efficacy of weight-based heparin and its correlation with the patient's percent above ideal body weight (IBW).

PRELIMINARY RESULTS: Data collection is still in progress. Preliminary results have been analyzed for 50 patients. Thirteen patients were greater than 50% above their IBW. Overall, there was a 12% incidence of AE detected. Fifty percent of the AE were in patients greater than 50% above their IBW and 50% were heart failure patients.

PRELIMINARY CONCLUSIONS: To date, a trend has been identified toward increased risk, incidence, and severity of AE in patients greater than 50% above their IBW. Conclusions of this evaluation will be utilized to revise the heparin protocol based upon patient demographics.

Learning Objectives:

To evaluate the safety and efficacy of the current weight-based heparin protocol implemented at TTH/TCH in obese patients.

To identify the need for proactive dosage adjustments based upon patient demographics.

Self Assessment Questions:

The half-life of heparin may be:
A. Decreased with pulmonary embolism.
B. Increased with hepatic cirrhosis.
C. Increased with end-stage renal disease.
D. A and C are correct.
E. All of the above are correct.

Adjustments in weight-based heparin protocols in obese patients can be justified by:
A. Volume of blood in adipose tissue equals the volume of blood in lean tissue.
B. Volume of blood in adipose tissue is greater than the volume of blood in lean tissue.
C. Volume of blood in adipose tissue is less than the volume of blood in lean tissue.
D. None of the above are correct.

BLOOD GLUCOSE CONCENTRATION DOES NOT CORRELATE WITH ORGAN FAILURE OR OUTCOME IN TRAUMA PATIENTS RECEIVING ENTERAL NUTRITION.

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Purpose: Recent randomized prospective studies have associated hyperglycemia with an increased morbidity and mortality in critically ill patients and suggest intensive insulin therapy is associated with better outcomes. However, studies specifically evaluating this relationship in trauma patients are lacking. In addition, the association between caloric intake and blood glucose concentrations remains unclear. The objective of this study was to evaluate the relationship between blood glucose concentrations and outcomes in critically ill trauma patients receiving enteral nutrition.

Methods: This study is a retrospective chart review assessing blood glucose concentrations in 120 adult trauma patients receiving enteral nutrition during their initial stay in the intensive care unit (ICU). The relationship between blood glucose concentrations and organ function (renal, pulmonary, cardiovascular, central nervous system), ventilator days, amount of calories received, ICU length of stay (LOS), hospital LOS, and number of infections was evaluated using linear regression.

Results: Patients had a mean age of 43.6 years (SD ±18.1); 73.3% (n=88) patients were male; and 8.3% (n=10) of the population had a diagnosis of diabetes mellitus prior to admission. Blood glucose concentrations did not show a correlation with organ failure: renal ($R^2 = 0.002$), pulmonary ($R^2 = 0.023$), cardiovascular ($R^2 = 0.001$), or central nervous system ($R^2 = 0.002$). Blood glucose concentrations did not show a correlation with caloric intake ($R^2 = 0.018$), infection ($R^2 =0.022$), ventilator days ($R^2 =0.010$), ICU LOS ($R^2 =0.021$), or hospital LOS ($R^2 =0.006$).

Conclusions: Blood glucose concentrations are not associated with organ failure, ventilator days, number of infections, ICU LOS, or hospital LOS in critically ill trauma patients receiving enteral nutrition. In addition, blood glucose concentrations are not affected by the amount of calories administered to trauma patients while in the ICU.

Learning Objectives:

Identify the potential causes of hyperglycemia in a critically ill patient.

Identify the proposed advantages to euglycemia in a critically ill patient.

Self Assessment Questions:

T or F: Hyperglycemia has been associated with increased morbidity and mortality in critically ill patients.

T or F: Hyperglycemia was associated with caloric intake in this study.

EXPLORING PATIENT PREDICTORS OF SUCCESS IN A COMMUNITY PHARMACY BASED DIABETES TELEMONITORING PROGRAM

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Background: Community pharmacists have an opportunity to utilize telemonitoring technology and their relationships with local providers to create a collaborative home-based patient requires careful patient screening to assist the pharmacist in identifying and enrolling patients who are likely to succeed in the telemonitoring program.

Purpose: The purpose of this study is to identify patient characteristics, via survey instrument, that may predict an individual's successful participation in a home-based telemonitoring program.

Methods: Patients enrolled in the Lakeshore Apothecare Diabetes Telemonitoring Program are potential subjects. Participation is voluntary and consent to participate will be asked via a cover letter accompanying the final survey. As part of the Lakeshore Apothecare Diabetes Telemonitoring Program, all patients enrolled between December 14, 2004 and March 1, 2005 will receive a survey prior to their training on how to use the telemonitoring device. Subjects will be assigned a code number that appears on the first survey. Each subject will be in the study for four weeks. Using only the code number received upon completion of the first survey, the pharmacy manager and coordinator of the Program will alert the researchers if any subject has discontinued use of the telemonitoring device. Either at the end of four weeks or following the discontinued use of the telemonitoring device, each subject will receive the second and final survey.

Results: Data results are being collected. Results will be presented

Conclusions: The statistical analysis of the surveys result will enable a determination of significant characteristics of patients who participate in the telemonitoring program for at least four weeks, and will contribute greatly to the Lakeshore Apothecare Diabetes Telemonitoring Program through improvements and lead to a better Program for future patients.

Learning Objectives:

To identify patient characteristics that may predict their successful participation in a home-based telemonitoring program.

To identify barriers that may interfer with the patient's successful participation in a home based telemonitoring program.

Self Assessment Questions:

True or False. Higher patient education level correlates to patient's successful participation in a home-based telemonitoring program?

True or False. Patients feel safer when they know they are being monitored by their pharmacist?

6 MONTH EFFICACY OF COMBINATION FIRST LINE AGENTS FOR SMOKING CESSATION- A RETROSPECTIVE STUDY

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Objective: Combination therapy for smoking cessation may provide an additional treatment option for highly addicted smokers and those failing monotherapy. Studies have found that combination therapy with the nicotine patch and one of the other first-line agents increases efficacy compared to monotherapy or placebo. The purpose of this research is to assess the efficacy of using combination therapy for smoking cessation. A secondary outcome of this study is to identify specific patient populations that may benefit from combination therapy.

Methods: This research is a retrospective chart review of subjects seen in the Smoking Cessation Clinic from 1998 to November 2004 at the University of Illinois at Chicago Medical Center. Information that will be evaluated includes demographic data, medical, medication, and smoking history, motivation to quit, treatment provided, and outcomes of therapy. Cost, adverse events, and adherence to medications will also be considered. Efficacy of treatment is defined as complete abstinence from smoking for six months. Abstinence is determined by carbon monoxide measurement and self-reporting.

Results: Results to be presented include demographics of the clinic population, the combination or monotherapy utilized, and the quit rate at 6 months. Subjects utilizing monotherapy will be compared to those subjects on combination therapy with respect to treatment outcomes, cost, and adherence.

Conclusions: Analysis of this data will identify specific combinations of first-line medications along with specific subject characteristics that enhance cessation. These results may influence the current practice within the Smoking Cessation Clinic at UIC.

Learning Objectives:

To assess the efficacy of using combination therapy for smoking cessation.

To identify those patients that may benefit from combination therapy for smoking cessation.

Self Assessment Questions:

T/F Combination therapy for smoking cessation is shown to be more efficacious than monotherapy.

T/F The only combination proven to be efficacious is the nicotine patch with bupropion SR.

RELEVANCE OF A LOADING DOSE IN THERAPEUTIC MANAGEMENT OF UNFRACTIONATED HEPARIN

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Introduction: A heparin loading dose is used to counterbalance the acute hypercoagulable state of a patient by achieving therapeutic levels in the shortest period of time. But is a loading dose necessary to achieve this outcome and at what cost? Not only are heparin's pharmacokinetic properties such that when administered intravenously it has immediate onset of action, but there is also a direct correlation between doses and bleeding.

Purpose: To compare the safety and efficacy of a heparin loading dose to no loading dose in patients indicated for antithrombotic therapy. The primary outcome is percentage of activated partial thromboplastin times (aPTT) after initiation of unfractionated heparin (UFH) that are within therapeutic range. Secondary outcomes include time to first therapeutic aPTT and to two consecutive therapeutic aPTTs. Negative outcomes that may have occurred as a result of aPTTs outside therapeutic range will also be analyzed.

Methods/Results: We propose to perform a retrospective review of patient medical records and monitoring data completed by anticoagulation service. We will look at patients who were accepted for consultation by anticoagulation service from March 2004 to present. Patients will be categorized into two groups: those who received an UFH loading dose and those who received UFH without a loading dose. Monitoring parameters will include sex, age, weight, indication for heparin use, past medical history, goal aPTT, baseline labs and the time, heparin dose and subsequent aPTTs in the first 24 hours after initiation of UFH therapy. Extenuating events including bleeding and clotting will be evaluated for association with aPTTs not in range. Results from the two groups will then be compared using odds ratios with 95% confidence intervals.

Conclusion: We expect that patients who received a loading dose will have more aPTTs outside the therapeutic range compared to those who did not receive a loading dose.

Learning Objectives:

To determine the relevance of a loading dose in UFH therapy for management of coagulable states.

To realize the risks involved in mis-management of UFH.

Self Assessment Questions:

Describe the American College of Chest Physicians guidelines for dosing of UFH?

Identify the hemorrhagic complications associated with UFH?

PHARMACIST RUN MEDICATION HISTORY AND RECONCILIATION: A MODEL FOR CONTINUITY OF CARE.

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The information presented will be a pharmacy run accurate medication history implementation with inclusion of recent data collection and future directions that the hospital plans to achieve the JACHO standard for medication histories. An accurate medication history is essential for the proper implementation of health care in the hospital setting. An accurate medication history is vital for proper continuity of care when a patient is brought into the hospital for acute treatment of a medical problem. When a patient is admitted to the hospital, often the admitting physician does not know the patient. The physician's focus is on treatment of the acute problem, this may lead to the physician not obtaining an accurate medication history. This leaves the patient at risk for stopping a medication that would not be intentionally stopped. A pharmacist run medication history was developed to try to provide an accurate medication history on every patient admitted to the nursing unit, as well as provide a means to reconcile those medications not ordered on admission. For two weeks, all patients admitted or discharged during day shift pharmacy coverage on the respiratory intermediate care unit will have their admission history and discharge reconciliation data collected. Over the two week collection period 44 patients were admitted and 69 medications were requested to be reconciled. In that same time 41 patients were discharged and 25 discharge medications were clarified. Pharmacists can have a large impact on continuity of care when a patient enters and leaves the hospital.

Learning Objectives:

To understand why it is important to have an accurate medication history for every patient who is admitted to the hospital.

To identify the types of clarifications most seen when a patient is admitted to the hospital.

Self Assessment Questions:

What were the two most common types of clarification needed?

Name three reasons why a pharmacist is uniquely qualified to conduct medication histories?

WHICH IS BETTER FOR MAC PROPHYLAXIS: AZITHROMYCIN 1200 MG WEEKLY OR AZITHROMYCIN 250 MG DAILY?

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Background: Mycobacterium avium complex (MAC) infects about 20-30% of people who have Acquired Immunodeficiency Syndrome (AIDS). Azithromycin 1200 mg once weekly is the standard of care for preventing MAC infections in AIDS patients with a low CD4 lymphocyte count. However, many patients cannot tolerate the gastrointestinal effects that are associated with large doses of azithromycin.

Objectives: The primary objective was to determine whether azithromycin 250 mg daily was better tolerated and as effective as azithromycin 1200 mg once weekly for MAC prophylaxis. Other objectives were to compare patient outcomes with no prophylaxis, prophylaxis with azithromycin, and prophylaxis with other antimicrobial agents.

Methodology: This study received approval from the Institutional Review Board and was a retrospective chart review of patients from the Ryan White Title III Clinic. Patients were identified by the outpatient pharmacy fill records at University of Louisville from January 2002 to December 2003. In addition, patients with a CD4 lymphocyte count ≤ 75 cells/mm3 during the same time period were identified through the CarewareÒ database.

Results: Approximately 203 patients were evaluated and 110 patients met the inclusion criteria. Three patients (8%) in the azithromycin 250 mg daily group and two patients (3%) in the azithromycin 1200 mg weekly group had the presence of MAC. Eleven patients (18%) on the weekly regimen and five patients (14%) on the daily regimen switched therapy due to possible intolerance. There was no significant difference in compliance rates between the azithromycin 250 mg daily and the azithromycin 1200 mg weekly regimen.

Conclusions: Preliminary results show that azithromycin 1200 mg weekly appeared to be equally tolerated and more efficacious than azithromycin 250 mg daily, however the sample size was too small to detect a statistical difference. In addition, a comparison could not be made with other antibiotics due to the small sample size.

Learning Objectives:

1) Discuss reasoning for use of azithromycin 250 mg daily as opposed to azithromycin 1200 mg weekly for MAC prophylaxis.

2) Determine whether azithromycin 250 mg daily was better tolerated and as effective as azithromycin 1200 mg once weekly for MAC prophylaxis.

Self Assessment Questions:

1) TRUE or FALSE Azithromycin 250 mg daily is better tolerated and as effective as azithromycin 1200 mg weekly.

2) Azithromycin is used for prophylaxis of which opportunistic infection

a. Pneumocystis carinii
b. Cryptococcus
c. Mycobacterium avium complex
d. Toxoplasmosis
e. None of the above

INCIDENCE AND SEVERITY OF BLEEDING IN PATIENTS WHO RECEIVE BIVALIRUDIN OR GLYCOPROTEIN IIB/IIIA INHIBITORS PLUS HEPARIN FOR PERCUTANEOUS CORONARY INTERVENTION

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PURPOSE: Bivalirudin, a direct thrombin inhibitor, has been shown to be statistically not inferior to heparin plus glycoprotein IIb/IIIa inhibitors and is associated with less bleeding in patients undergoing percutaneous coronary intervention (PCI). The objective of this study is to determine the incidence and severity of bleeding at our institution in patients receiving bivalirudin or glycoprotein IIb/IIIa inhibitors plus heparin for PCI.

METHODS: A retrospective review, from January - June 2004, will be performed in patients who received adjunctive therapy for PCI. The following data will be collected: age, gender, weight, height, serum creatinine, significant past medical history, home medications, pretreatment clopidogrel, transfusion requirements, dose received, and adverse effects. Major bleeding will be defined as intracranial, intraocular, or retroperitoneal hemorrhage, clinically overt blood loss resulting in a decrease in hemoglobin > 3 g/dL, any decrease in hemoglobin of 4 g/dL, or transfusion of 2 or more units of packed red blood cells or whole blood. Minor bleeding will be defined as clinically overt bleeding not meeting criteria for major bleeding.

RESULTS: A total of 407 patients received adjunctive therapy for PCI. The glycoprotein IIb/IIIa plus heparin group is still being analyzed. Seventy-nine patients received bivalirudin for PCI. In the bivalirduin group, six patients had an episode of major bleeding and six patients had an episode of minor bleeding. All of the bivalirudin patients who bled had renal impairment (CrCl < 59 mL/min) and three-quarters were given the wrong dose for their renal function. The average length of stay in patients who had major bleeding was eleven days, minor bleeding was six days, and no bleeding was 3 days.

CONCLUSION: The incidence and severity of bleeding associated with eptifibatide and abciximab plus heparin use will be compared against the observed incidence associated with bivalirudin

Learning Objectives:

Determine the incidence and severity of bleeding in patients receiving bivalirudin or glycoprotein IIb/IIIa inhibitors plus heparin for PCI

Identify patients at risk for bleeding (i.e. age, reduced renal function, women)

Self Assessment Questions:

Bivalirudin is a direct thrombin inhibitor used during percutaneous coronary intervention. T/F

Bivalirudin has been shown to be statistically not inferior to glycoprotein IIb/IIIa inhibitors plus heparin and it is associated with less bleeding in patients undergoing PCI. T/F

PHARMACISTS INTERVENTION IN CARDIAC RISK REDUCTION FOR PATIENTS WITH THE METABOLIC SYNDROME

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Purpose:
For patients identified with the Metabolic Syndrome (MetS), the purpose of this study is to 1) assess patient perceptions of personal cardiovascular risks, 2) measure changes in outcomes of cardiovascular risk measures with the pharmacist intervention and 3) report on patient satisfaction.

Methods:
Patients will be recruited through wellness screenings. Patients must meet 3 out of 5 criteria for MetS according to NCEP-ATP III guidelines. Eligible patients will be contacted by a clinical pharmacist for voluntary enrollment in the Cardiac Risk Reduction (CRR) clinic. The pharmacist will meet with each patient initially and at 4-week intervals up to 12 weeks, and follow-up at 24 weeks. At each visit, a Framingham 10-year risk prediction score will be calculated, and measurements of total cholesterol, LDL, HDL, triglycerides, blood pressure, fasting blood glucose, abdominal girth, and weight will be performed. The pharmacist will provide patient education on lifestyle modification and serve as a health coach to assist the patient in setting goals to decrease risks. Patients will complete baseline surveys to assess patient satisfaction with pharmacist care and to assess perceived cardiovascular risks. The patient satisfaction survey will be repeated at 12 weeks and at 24 weeks and the assessment of perceived cardiovascular risks will be repeated at 12 weeks.

Results:
To date, of the 58 patients screened, 11 patients have met the diagnostic criteria for MetS and therefore qualify for the study. Screenings and data collection will continue. Currently, two patients are enrolled in the study. Outcomes measured will include patient satisfaction with the program, changes from baseline of Framingham 10-year risk scores, changes in diagnostic parameters, and changes in patient perceptions of cardiovascular risks.

Conclusions:
It is expected that improvements will be seen in cardiovascular risk measures and that patients will be satisfied with the pharmacist's intervention.

Learning Objectives:

Understand the diagnostic criteria for the metabolic syndrome according to the NCEP-ATP III guidelines.

Evaluate the prevalence of metabolic syndrome and discuss current pharmacologic and non-pharmacologic recommendations for treatment.

Self Assessment Questions:

True or False: A patient may meet the diagnostic criteria for metabolic syndrome regardless of LDL cholesterol level.

True or False: The World Health Organization definition of metabolic syndrome differs from the NCEP-ATP III definition in that it focuses on glucose regulation and insulin resistance.

COMPLIANCE WITH SEQUENTIAL COMPRESSION DEVICES USED FOR VENOUS THROMBOEMBOLISM PROPHYLAXIS IN SURGICAL PATIENTS

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Purpose: Sequential compression devices (SCD's) are commonly used to prevent venous thromboembolism (VTE) in surgical patients but compliance with these devices is presumed to be poor. We chose to evaluate compliance with SCD's in surgical patients.

Methods: This prospective, observational study evaluated consecutive surgical patients, 18 years of age and older, who were prescribed SCD's as part of routine therapy. Compliance was assessed twice daily and assessments ended once the patient was ambulating or the order for SCD's was discontinued. A compliance score was calculated by dividing the number of compliant evaluations by the total number of assessments.
Compliance scores were calculated for all patients and then compared between intensive care unit (ICU) and non-ICU patients. Additionally compliance was assessed for high risk patients where SCD's were the sole method of prophylaxis.

Results: To date, 74 patients (234 patient days) have been evaluated. The mean age was 58 ± 20 years, and the mean weight was 92 ± 19 kg. Sixty-one percent (45/74) were in an ICU, 76% (56/74) were considered high risk and 46% (34/74) had no other form of prophylaxis. The median study duration was 2 (1-14) days. Overall compliance with SCD use was 93 ± 14%. Compliance was lower in high risk patients with no other method of prophylaxis (87 ± 19%, p=0.051). Compliance scores were similar in ICU and non-ICU patients (91 ± 17% vs. 95 ± 8%, p=0.169).

Conclusions: Based on preliminary results, compliance rates are adequate in hospitalized surgical patients. There is no difference in compliance between ICU and non-ICU patients. Compliance in patients at greatest risk for VTE however, can be improved.

Learning Objectives:

Determine the level of risk for venous thromboembolism in a given hospitalized surgical patient.

Describe the mechanism of action of sequential compression devices for the prevention of venous thromboembolism.

Self Assessment Questions:

According to the criteria presented, who would be classified as highest risk for venous thromboembolism?
a. Minor surgery in patients < 40 years of age with no additional risk factors
b. Surgery in an 18 year old male status post major trauma
c. Minor surgery in patients with additional risk factors
d. Surgery in patients aged 40-60 years old with no additional risk factors

Which of the following are risk factors for venous thromboembolism?
a. Obesity
b. Smoking
c. Previous venous thromboembolism
d. All of the above

MULTICENTER, OPEN-LABEL PILOT STUDY OF MINOCYCLINE FOR THE TREATMENT OF CETUXIMAB-INDUCED ACNEFORM RASH

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Cetuximab is a human/mouse chimeric monoclonal antibody that competitively blocks epidermal growth factor and transforming growth factor alpha from binding to the epidermal growth factor receptor. The most common side effect of cetuximab reported in clinical trials and case reports is acneform rash. The incidence of acneform rash with cetuximab monotherapy is 90% for all National Cancer Institutes Common Toxicity Criteria grades (1-4) and 8% for grades 3-4. Case reports of successful treatment of the cetuximab-induced acneform rash include the use of 4% colloidal sulfur galenic cream, topical clindamycin, and topical triamcinolone cream. The acneform rash seen with cetuximab most resembles acne vulgaris. Current dermatologic therapy for acne vulgaris includes oral antibiotics, topical antibiotics, topical steroids, benzoyl peroxide, sulfur-containing topicals, topical tretinoin, and oral tretinoin. To date, no study has evaluated the treatment options for the cetuximab-induced acneform rash.
This project is an open-label pilot study evaluating minocycline in patients developing a cetuximab-induced acneform rash. Patients will receive minocycline 100 mg capsules by mouth twice daily for 28 days or until rash resolution.
Primary Outcomes: The time to improvement of a cetuximab-induced rash as defined by a one-grade decrease in the National Cancer Institute Common Toxicity Criteria version 3.0 using minocycline therapy. Secondary Outcomes: 1) Patient satisfaction with minocycline therapy as measured by an investigator developed tool, 2) improvement in patient quality of life score as measured by the Skindex-16ã dermatology based quality of life tool, and 3) type and frequency of adverse drug events associated with the use of minocycline per patient report in patient diary.
Subjects enrolled will be greater than or equal to 18 years of age presenting to the Health Alliance of Greater Cincinnati, UC Hematology/Oncology Physicians, and the Cincinnati VA receiving cetuximab for any cancer and develop a rash.
Results: Patient accrual is currently ongoing.

Learning Objectives:

To summarize the incidence of the cetuximab-induced acneform rash and previous treatments used for treatment.

To analyze the efficacy of minocycline as a treatment option for the cetuximab-induced acneform rash.

Self Assessment Questions:

True or False. There are no linkages in the literature between the acneform rash and response in cetuximab therapy.

True or False. Minocycline has anti-inflammatory, immunomodulatory as well as antibacterial activity.

EFFECT OF PALIVIZUMAB ADMINISTRATION ON THE INCIDENCE AND SEVERITY OF RESPIRATORY SYNCYNTIAL VIRUS

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PURPOSE: Palivizumab (Synagis®) is a humanized recombinant monoclonal antibody against respiratory syncytial virus (RSV). The American Academy of Pediatrics (AAP) has published specific criteria for identifying those patients most at risk of serious RSV infection and developed recommendations for the use of palivizumab in this patient population. The goal of this study was to determine the effect of palivizumab on the incidence and severity of RSV infections. METHODS: Electronic and paper chart reviews were conducted on all patients admitted to Kosair Children's Hospital with a positive RSV antigen test during the RSV season November 1, 2004 through March 31, 2005. When possible, parent or caregiver interviews were utilized for those patients in which the desired data was not documented in the chart. Demographical data was gathered for each patient, along with length of stay, risk factors for serious RSV infection, level of care required, oxygen requirement, and need for mechanical ventilation. RESULTS: Data collection is ongoing at this time. Initial findings indicate that only 6% of patients admitted with a positive RSV antigen met AAP guidelines to receive palivizumab. Of those who met AAP criteria, only half had received palivizumab during the RSV season. Average length of stay for all subjects was 3.5 days. CONCLUSION: The conclusion of this study is pending further data collection and will be available in April 2005.

Learning Objectives:

To determine the impact of palivizumab administration on the incidence of respiratory syncytial virus.

To identify the effect of palivizumab administration on the severity of respiratory syncytial virus.

Self Assessment Questions:

True or False: Most patients hospitalized with RSV meet the AAP guidelines to receive palivizumab.
Answer: False

Which of the following is not a possible risk factor for developing RSV?
A. Gestational age less than 35 weeks
B. Exposure to smoke or other pollutants
C. Race
D. Chronic lung disease
E. School-aged siblings
Answer: C. Race

IMPLEMENTATION OF SURGICAL ANTIMICROBIAL PROPHYLAXIS GUIDELINES

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Background/Objective: Surgical antimicrobial prophylaxis (SAP) reduces morbidity and mortality associated with surgical procedures. However, extended SAP inflates costs, can increase the incidence of antibiotic adverse events and may contribute to the formation of resistant bacteria. Limiting the duration of SAP can improve these outcomes. National guidelines have recommended SAP be limited to less than 24 hours. The purpose of the project is to analyze the prescribing patterns of SAP at Froedtert Hospital, a 426-bed academic medical center in Milwaukee, WI. The project will also compare this data to national guidelines and attempt to bring Froedtert into compliance with these guidelines.

Methods: A review of national guidelines, adopted from evidence-based medicine, was conducted and supports limiting the duration of SAP in defined populations. Data reflecting the current duration of SAP for patients undergoing select cardiac, neurologic, orthopedic/spinal, gastrointestinal and gynecologic surgeries at Froedtert was collected from Froedtert billing records and the University HealthSystem Consortium (UHC) database. The duration of SAP at Froedtert was compared to national guidelines to determine compliance and potential cost avoidance. Presentation of the national SAP guidelines, Froedtert SAP duration/cost data, and UHC comparison data will be made to Froedtert's Infection Control Committee, Antibiotic Subcommittee and Pharmacy, Nutrition and Therapeutics Committee (PNT). Limiting the duration of SAP to reflect national guidelines will be contingent on PNT approval.

Results: Data collected indicate that SAP at Froedtert and at other UHC hospitals often extends beyond the recommended 24 hours. Further analysis revealed that the duration of SAP varied among individual prescribers and services. Additionally, the data show a significant potential for cost avoidance, if SAP is limited to 24 hours or less. Implementation of the project is ongoing.

Learning Objectives:

To summarize current national guidelines for the appropriate duration of surgical antimicrobial prophylaxis.

To evaluate duration of surgical antimicrobial prophylaxis among different surgical services at Froedtert Hospital, a 426 bed academic medical center.

Self Assessment Questions:

T/F Surgical antimicrobial prophylaxis should be limited to 24 hours after surgery?

T/F The only potential impact of prolonged surgical antimicrobial prophylaxis is increased cost?

EVALUATION OF ASPIRIN AND NON-STEROIDAL ANTI-INFLAMMATORY AGENTS IN VA DIABETIC PATIENTS IN AMBULATORY PRIMARY CARE AND DIABETES CLINICS

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Purpose:
a) To determine the extent that ambulatory patients with diabetes receive prophylactic aspirin therapy according to the ADA guidelines.
b) To determine the extent that ambulatory patients with diabetes receiving prophylactic aspirin therapy concurrently use NSAIDs.

Methods:
This study protocol is approved by the Human Subjects Committee at University of Wisconsin-Madison and by the Research and Development Committee at the William S. Middleton Memorial VA Hospital. A telephone survey of 180 diabetic subjects receiving medical care at the VA Hospital in either Primary Care or Diabetes Clinics is being conducted. Potential subjects, selected by a table of random numbers, are pre-screened to ensure that no exclusion criteria are documented in the medical record. Potential subjects are then mailed an informational letter about the study that includes the elements of informed consent. No further contact of subjects will occur after they have been excluded from the study or received the letter and requested to opt out; these subjects will be replaced until goal sample size is achieved. Further screening for exclusion criteria is conducted during the telephone interview during data collection. The following data are being collected: aspirin use, dose, and timing; source for obtaining aspirin; NSAID use, dose, and timing; and screening for aspirin indications and contraindications.

Summary of Results:
All potential subjects have been randomly assigned. Pre-screening and subject invitation are ongoing. 106 telephone interviews have been conducted; participation to date includes 70 Primary Care Clinic subjects and 36 Diabetes Clinic subjects.

Conclusions:
Study findings will be presented to Diabetes Clinic and Primary Care Clinic providers. If variability is found between the clinics, providers will be re-educated about American Diabetes Association aspirin use recommendations. If significant numbers of subjects are taking concurrent aspirin and NSAIDs, the frequency of cardiovascular events in these subjects may need to be determined.

Learning Objectives:

To determine adherence rates with ADA guidelines for diabetic patients receiving prophylactic aspirin therapy in Primary Care and Diabetes Clinics at the William S. Middleton Memorial VA Hospital.

To identify the proportion of patients who may be affected by a potential drug interaction between aspirin and NSAIDs.

Self Assessment Questions:

True or False: A greater number of patients who receive care in Diabetes Clinic compared to Primary Care Clinic are routinely taking recommended daily prophylactic aspirin.

True or False: Thirty percent of study subjects may be affected by a potential drug interaction between aspirin and NSAIDs.

OPTIMIZING THE USE OF ALBUMIN IN THE TREATMENT OF INTRADIALYTIC HYPOTENSION

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Hypotension is the most common complication of hemodialysis, affecting approximately 20-30% of these patients. The current treatment of intradialytic hypotension focuses on increasing blood volume. Agents currently used in the treatment of hypotension during dialysis include 25% albumin, 0.9% sodium chloride, 23.4% sodium chloride, and mannitol. Although studies have shown that normal saline is extremely effective in the treatment of hypotension during dialysis, albumin is often used as a first line agent. The objective of this project is to promote the use of first line agents that are safer and more cost effective than albumin.

A treatment protocol for intradialytic hypotension was developed after a literature review. The initial protocol was reviewed and modified based on feedback from the nurses and physicians. The final protocol was implemented in the dialysis unit after approval by the nephrologists. The entire dialysis staff, including physicians, nurses, and technicians, were educated on the format and efficacy of the new protocol.

The new intradialytic hypotension protocol was implemented on February 1, 2005. The total albumin use will be evaluated before and after the completion of the study to assess adherence and effectiveness of the new intradialytic hypotension protocol. Protocol utilization will be assessed on a daily basis in the dialysis unit census before, during, and after implementation. Albumin usage date from the previous twelve months will be used as a baseline to provide documentation that the new protocol decreases albumin use without adversely affecting patient care.

Data collection is ongoing and will be presented at the Great Lakes Residency Conference.

Learning Objectives:

Discuss treatment options for intradialytic hypotension.

Identify first-line therapies for intradialytic hypotension based on safety, efficacy, and cost effectiveness.

Self Assessment Questions:

T/F: Hypotension is a most frequent complication of hemodialysis.

T/F: Albumin is the most safe, effective, and economical therapy for intradialytic hypotension.

EVALUATION OF APPETITE STIMULANTS IN THE CYSTIC FIBROSIS POPULATION

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Background: Weight loss caused by an increased caloric demand and elevated metabolic rate due to malabsorption and anorexia is common in many cystic fibrosis patients. Prolonged weight loss and malnutrition in these patients can significantly affect diaphragm strength, as well as overall morbidity and mortality. Appetite stimulants may help those patients who are unable to maintain adequate nutritional status. Megestrol acetate, a synthetic progestin, and cyproheptadine hydrochloride, an antihistamine with serotonin antagonist properties, have been shown in limited studies to improve weight gain in patients with cystic fibrosis.

Objective: The purpose of this study is to evaluate the effects of megestrol acetate and cyproheptadine hydrochloride on weight in the cystic fibrosis population.

Methods: A retrospective chart review of patients diagnosed with cystic fibrosis who have taken megestrol acetate and/or cyproheptadine hydrochloride in the last twelve months to improve weight gain was performed. Dose and duration of study medication, as well as the use of concomitant medications, were recorded. Baseline characteristics included age, sex, weight, height, ideal body weight (IBW), %IBW, body mass index (BMI), body mass index percentile (BMIp), and skin fold measurements. Weight, IBW, %IBW, BMI, BMIp, and skin fold measurements were compared to baseline characteristics. Adverse effects occurring during treatment period were noted.

Conclusions: Data collection is ongoing. Preliminary assessment of the impact of appetite stimulants on weight gain in the cystic fibrosis population will be presented.

Learning Objectives:

Identify the risks of malnutrition in cystic fibrosis patients.

Evaluate the efficacy of megestrol acetate and cyproheptadine hydrochloride as appetite stimulants in cystic fibrosis patients.

Self Assessment Questions:

Malnutrition can lead to poor lung function in cystic fibrosis patients. T or F

Weight gain from megestrol acetate and cyproheptadine hydrochloride is primarily lean body mass. T or F

DIFFUSION OF MEDICATION SAFETY-RELATED TECHNOLOGY INNOVATIONS IN HEALTH CARE ORGANIZATIONS: A QUALITATIVE STUDY.

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Purpose: Computerized prescriber order entry (CPOE) and bedside barcode technology are solutions proposed to create a safer acute patient care environment. Reports indicate limited diffusion of these medication safety-related technologies in inpatient care. The purpose of this study was to investigate explanations for this trend by obtaining the perspectives of health-system pharmacy administrators.

Methods: Twelve pharmacy directors participated in two ninety-minute focus group sessions. A semi-structured focus group guide provided questions to stimulate discussion, with participants encouraged to expand their comments throughout the session. Topics covered in the guide included organizational processes for adopting innovations, relative advantages and disadvantages of CPOE and barcode technology, influences driving the adoption of safety technologies, and predictions about the future state of technology in health care. Each focus group discussion was recorded and then transcribed. A coding frame was constructed based on the transcripts to facilitate analysis using the qualitative data analysis program, ATLAS.ti.

Results: Pharmacy directors described the procedure for adopting and implementing medication safety-related technologies as a multidisciplinary process. Regarding CPOE and bedside barcode technology specifically, directors noted that existing technology is not ideal; some informants suggested that these technologies are shifting errors to a different node of the medication use process. Participants reported that the primary external influences driving adoption of these technologies include technology vendors, regulatory agencies, and quality-focused consumerism in health care. Respondents were not entirely optimistic about the potential for CPOE and bedside barcode technology to reliably improve patient safety.

Conclusions: Widespread, successful adoption of medication safety-related technologies appears to be inhibited by imperfect products and processes that may facilitate other types of errors and threats to patient safety. Consensus among health-system pharmacy directors indicates perceptions that a reliable interface between humans and technology innovations that supports standardized provision of high-quality health care remains to be discovered.

Learning Objectives:

To understand the processes involved with evaluating and implementing technology innovations in an acute patient care environment.

To recognize advantages and challenges associated with the implementation of computerized prescriber order entry and bedside barcode technology.

Self Assessment Questions:

T or F The process for evaluting technology innovations is generally interdisciplinary in nature.

T or F Barcoding all drug products is one of the challenges associated with the implementation of bedside barcode technology.

ROSUVASTATIN MEDICATION USE EVALUATION: CLINICAL OUTCOMES AND PATIENT SAFETY

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Purpose

The main objectives of this study are to determine if patients currently on rosuvastatin are meeting their low density lipoprotein (LDL) goals, based on the National Cholesterol Education Program Adult Treatment Panel III Guidelines, and if patients were meeting goals on previous HMG CoA reductase therapy. Additional information will be gathered about the safety of rosuvastatin.

Methods

Prior to commencement, this study was submitted to the Institutional Review Board for approval. The computerized patient record system was used to identify patients from the Zablocki VA Medical Center and associated clinics who were initiated on rosuvastatin between April 1st 2003 and June 30th 2004. Patients receiving rosuvastatin for less than twelve weeks, patients with no baseline LDL values, and patients with triglycerides too high to calculate LDL will be excluded.

Preliminary results

One-hundred seventy chart reviews have been completed. Data collection is ongoing and full results will be presented at the Great Lakes Residency Conference.

The average baseline LDL was 129.6 mg/dL and the first follow-up LDL was 104.7 mg/dL.

The most common initial dose was 20mg, with 59 patients started at this dose. Fifty-two patients started on 10mg. Thirty-six started on 40mg, and 20 started on 5mg.

Of the 170 patients, 149 had an appropriate dose based on renal function and drug interactions. Twenty-four patients were on concurrent gemfibrozil therapy. Thirteen were not on an appropriate dose.

Myalgia was the most common adverse reaction, which accounted for seven out of 13 reactions.

Conclusions

From preliminary findings, it appears that some patients were initiated on too high of a dose. Not all prescribers are following dosing guidelines advising that 10mg is the maximum dose of rosuvastatin for patients concurrently on gemfibrozil.

Learning Objectives:

Understand the LDL goals based on NCEP III.

Be able to identify the starting dose of rosuvastatin based on renal function

Self Assessment Questions:

What is the maximum dose of rosuvastatin if a patient also receives gemfibrozil?
A) 5mg
B) 10mg
C) 20mg
D) 40mg

Name two risk equivalents for coronary heart disease.

ACETYLCHOLINESTERASE INHIBITOR UTILIZATION IN A VA POPULATION

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Objectives:
The first line treatments of mild to moderate Alzheimer's dementia (AD) are acetylcholinesterase (AChE) inhibitors. Studies have shown that AChE inhibitors can improve cognitive function in patients with mild to moderate AD. There also has been some suggestion that these medications may delay the nursing home placement of patients with AD.

The cost of these medications is substantial, so a regional drug utilization evaluation (DUE) is being to determine overall usage patterns and the effectiveness of AChE inhibitors in VA patients.

Methods:
This study is a randomized retrospective chart review of William S. Middleton VA patients with an outpatient prescription for donepezil, galantamine, rivastigmine or tacrine between January 1, 2001 and December 31, 2003. Patients with a social security number ending in 3, 6, and 9 may be included in the data collection. Data to be collected includes the following: age, indication for AChE inhibitor use, initial and current dose, duration of therapy, date of medication initiation, documented stage of dementia, Mini-Mental State Exam scores at initiation, concomitant anticholinergic medications, adverse reactions, and the prescribing service. The location of the patient (outpatient, inpatient, or nursing home) and whether the patient switched AChE inhibitors will also be documented. Effectiveness will be assessed by review of documented objective data and subjective improvement.

Data collected from the William S. Middleton VA will be compiled with data from other VA Hospitals in the region to create the final DUE. The results of this DUE may guide future prescribing guidelines.

Results of the data collection are pending.

Learning Objectives:

Describe the prescribing practices of AChE inhibitors at the William S. Middleton VA Hospital.

Identify challenges in prescribing and monitoring AChE inhibitor use.

Self Assessment Questions:

How should the use of AChE inhibitors be monitored?

What are possible reasons of treatment failures of AChE inhibitors?

IMPLEMENTATION OF THE INSTITUTE FOR HEALTHCARE IMPROVEMENT (IHI) TRIGGER TOOL FOR ADVERSE DRUG EVENTS (ADES) AND EVALUATING THE RESULTS FOUND IN AN ACUTE CARE HOSPITAL

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Purpose:
ADEs have been a common problem in health care systems and are estimated to be one of the leading causes of death, ranking higher than the number caused by automobile accidents, AIDS, and breast cancer. It has also been estimated that 44-98,000 people die from a medical error in hospitals each year, however, only a small percentage is actually reported. The purpose of this study is to implement the IHI trigger tool in order to increase awareness of ADEs, to determine the rate of harm at Parkview, and to formulate solutions for problem areas.

Methods:
A team that is made up of a doctor, registered nurse, and a pharmacist are conducting the study. This team is completing a retrospective chart review of twenty charts each month using the IHI trigger tool. Exclusion criteria include charts that have less than a two day stay. The IHI trigger tool consists of nineteen triggers that can be searched for in each chart and consists of medications, lab tests, and vital signs. When a trigger is found, further research is done to determine whether or not it is a true ADE. If it is determined that there is an ADE, the team discusses and assigns a harm category. The harm category is categorized from A (no harm) to I (patient death). Category A through D is reported as a trigger, but not counted, as an ADE since these are errors did not cause harm to the patient. Category E indicates that temporary harm occurred to the patient and required intervention, category F also caused temporary harm to the patient and required or prolonged their hospital stay, category G indicates permanent patient harm, category H indicates that intervention was required to sustain life, and category I indicates a patient death.

Learning Objectives:

Common reasons for not reporting adverse drug events

How to use the IHI trigger tool

Self Assessment Questions:

Definition of an adverse drug event

What is the percentage that is commonly reported for ADEs?
A. 5-10%
B. 10-20%
C. 20-30%
D. > 50%

EFFECTS OF PHARMACIST INTERVENTION ON DISEASE AWARENESS AND LIFESTYLE MODIFICATIONS FROM A COMMUNITY PHARMACY HYPERTENSION PROGRAM.

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Objective(s): Hypertension was one of the leading causes of death in the U.S. in 2001. Fifty million Americans have high blood pressure. Community pharmacies filled approximately 52 million prescriptions for anti-hypertensive medications in 2002. With many patients using antihypertensive medications, this provides community pharmacists an opportunity to assist patients in effectively managing their high blood pressure. Community pharmacies have initiated hypertension management clinics that primarily focus on tracking patient refill records and providing blood pressure readings to their patients. The primary objective of this study will be to determine patients' baseline knowledge of hypertension and evaluate if interventions focused on patient education improves patient knowledge and behavior in regards to management of their hypertension.

Methods: The setting of this study will be a grocery store pharmacy. Fifty patients will be enrolled. This study will consist of three main phases. In phase one all patients will receive a questionnaire to assess their baseline knowledge and have their blood pressure measured. Phase two will consist of a group class to provide patients with education regarding blood pressure facts and will focus on various lifestyle modifications that will help improve blood pressure control. Blood pressure measurements will also be taken at this session. The final phase will consist of a follow-up survey that will assess changes in awareness and behavior. Medication refills will be monitored throughout the study. Descriptive statistics will be used to evaluate baseline knowledge, potential changes in refill history, post intervention knowledge, and changes in patient behavior in regards to their high blood pressure. The average blood pressure readings will also be compared.

Conclusion: The results of this study will be useful to community pharmacist developing hypertension management services. Discovering the effects of pharmacist intervention on disease awareness and lifestyle modifications will improve outcomes of hypertension services.

Learning Objectives:

Determine if pharmacist intervention effects disease awareness and behavior in patients with hypertension.

Identify lifestyle factors that contribute to hypertension.

Self Assessment Questions:

Which of the following can result from long standinh hypertension?
a Blindness
b Kidney Disease
c Stroke
d all of the above (answer)

Which of the following can contribute to high blood pressure?
a Smoking
b Physical Inactivity
c Diet
d all of the above (answer)

MEASURING THE IMPACT OF USP CHAPTER 797

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Background: On January 1, 2004, USP Chapter 797 was published as an enforceable standard for compounded sterile preparations (CSP's). USP modified previous information in chapter 1206, which pertained only to home infusion practices, and applied many of the same principles for all pharmacies that compound sterile preparations. These standards are more stringent than the ASHP “Guidelines on Quality Assurance For Pharmacy-Prepared Sterile Products.” According to a recent national survey, most pharmacies were not fully compliant with the ASHP Guidelines. Since USP Chapter 797 is more stringent, it could be assumed that most pharmacies are currently not compliant with this standard either. Thus, it is important to determine if there will be an impact of USP Chapter 797 on pharmacies across the nation.

Purpose: The purpose of this study is to determine how hospital pharmacies are responding to USP Chapter 797.

Methods: This study will utilize a survey methodology with up to four contacts per survey participant. Utilizing the SMG database as the sampling frame, 600 hospital pharmacy directors in the United States will be randomly selected to participate. An announcement letter will be sent to the survey participants. The survey will be mailed approximately one week later. A reminder postcard will be sent to all survey participants one week later. For the non-responders, a second survey will be sent with a cover letter approximately three weeks after the first survey mailing. The expected response rate is 50%.

Results: Results will be presented after data is collected and analyzed. The analysis will reflect current opinions of directors of pharmacy about USP Chapter 797, where they are focusing efforts to comply with the new standard, and the effect the chapter is having on the pharmacy department.

Conclusions: Conclusions will be presented after completing the analysis of the survey data.

Learning Objectives:

To understand how USP Chapter 797 is an enforceable standard

To understand where pharmacy directors are focusing their attention in trying to comply with USP Chapter 797

Self Assessment Questions:

True or False USP Chapter 797 can be enforced by state and national regulatory agencies (e.g. Board of Pharmacy, FDA).

List three areas of compliance that directors of pharmacy state are long-term action plans (i.e. needing > 12 months to comply with standard).

IMPACT OF COMMUNITY PHARMACY-BASED WELLNESS SCREENINGS ON PATIENT HEALTH BEHAVIORS

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PURPOSE:
To identify high-risk patients through a series of community pharmacy-based cholesterol, blood glucose, and blood pressure screenings; provide standardized one-on-one pharmacist counseling to all patients concerning lifestyle modifications and potential need for physician follow-up; and investigate patient compliance with pharmacist recommendations for health behavior changes and satisfaction with pharmacists' screenings.

METHODS:
Over the course of several months, pharmacists will host multiple wellness screenings at numerous community pharmacy locations. High-risk patients will be identified as defined by national consensus guidelines (i.e. JNC-7, NCEP ATP III, etc.). All patients will receive standardized, one-on-one pharmacist counseling that focuses on therapeutic lifestyle changes such as attaining healthy body weight, proper dietary and nutritional choices, adequate exercise, benefits of smoking cessation, criteria for physician follow-up, and potential drug therapy options. Patients identified as high-risk will then be asked to participate in the project. Surveys will be utilized to evaluate compliance with pharmacist counseling and patient satisfaction. Survey questions will measure a number of project outcomes including: patient's knowledge/awareness of abnormal laboratory value(s), changes to health behaviors based on screening and pharmacist counseling, new physician appointments due to results of screening and/or pharmacists' recommendations, new diagnoses made by physicians based on results identified at initial screening, changes in medication regimen, and patient satisfaction with wellness screenings.

PRELIMINARY RESULTS:
Forty-five patients have been screened with 19 subjects (42.2%) having laboratory measurements making them eligible for the study. All eligible patients (100%) have agreed to participate in the study. Final screening events, survey completion, and data analysis are currently in progress.

CONCLUSIONS:
To be discussed at Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Describe the impact of community pharmacy-based wellness screenings on patient health behaviors.

Understand the role of the pharmacist in screening and aiding in the management of diabetes, hypertension, and dyslipidemia.

Self Assessment Questions:

TRUE or FALSE. This study found that <25% of subjects screened had at least one (1) laboratory value considered high-risk or "not at goal".

TRUE or FALSE. To assess compliance with pharmacist counseling, the investigators utilized follow-up patient interviews.

RISK FACTORS FOR PSEUDOMONAS AERUGINOSA AMONG PATIENTS PRESENTING TO THE EMERGENCY DEPARTMENT

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Background: Pseudomonas aeruginosa (PA) is an important pathogen in hospitalized, critically ill patients. Based on previous research, we are currently able to identify patients at risk for nosocomial PA infection and select empiric antimicrobial therapy appropriately. However, it is unknown if specific risk factors exist for community-acquired PA infection.

Objective: This study will attempt to identify risk factors associated with PA infection among patients presenting to the emergency department (ED). In addition, it will assess antimicrobial susceptibility patterns and the impact of early appropriate antimicrobial therapy on patient outcomes.

Methodology: The study is a single site, retrospective chart review of patients with a positive PA sputum or blood culture taken in the ED between January 1998 and December 2003. For patients with multiple positive cultures, only the first positive culture will be included in the analysis. Data collection will include baseline demographic information, APACHE II score on presentation, laboratory values, culture identification, and susceptibilities. In addition, data collection will include, past medical history, comorbid conditions, severity of comorbid conditions (Charlson score), previous antimicrobial therapy, previous immunosuppressant therapy, recent hospitalization, empiric antibiotic selection, subsequent antibiotic therapy, length of hospital stay, and outcome. Statistical analysis will include bivariate and multivariate analyses of risk factors and clinical outcomes.

Preliminary Results: Prior to inclusion and exclusion criteria, 48 blood and 80 sputum cultures from 115 patients were identified. Susceptibility rates for PA in the ED are (%): ceftazidime (91), piperacillin (89), cefepime (76), tobramycin (91), aztreonam (85), ciprofloxacin (77), and imipenem (98). Additional data collection is in progress.

Conclusions: PA is an emerging pathogen in patients presenting to the ED. Complete analysis of risk factors and outcomes will be presented at the Great Lakes Residency Conference.

Learning Objectives:

Identify risk factors for a positive culture for PA in patients presenting to the ED.

Describe the effect of early appropriate antimicrobial therapy on outcomes among patients with a positive PA sputum or blood culture taken in the ED.

Self Assessment Questions:

T/F The incidence of pseudomonas aeruginosa among patients with community-acquired pneumonia is estimated to be 0-5%.

T/F Early appropriate empiric antibiotic therapy does not improve patient outcomes.

IMPACT OF A LETTER CAMPAIGN ON 90-DAY UTILIZATION OF MAINTENANCE MEDICATIONS

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Managed care organizations often encourage clients to exercise a 90-day filling option for maintenance medications. Encouraging 90-day fills over 30-day fills can result in significant plan and member savings due to deeper discounts and fewer dispensing fees. Traditionally, 90-day fills were available only through mail order. However, several pharmacy benefit management companies now offer patients the option of obtaining 90-day fills at retail. One way PBMs can promote 90-day utilization is by implementing a mailed letter campaign. No studies have examined the impact of a letter campaign on encouraging patients to obtain 90-day fills through either mail or retail.

The primary purpose of this study was to determine the impact of a letter campaign on increasing 90-day prescription fills. A secondary objective was to compare differences in 90-day utilization between members receiving a letter encouraging 90-day retail versus a letter encouraging 90-day mail.

Two versions of a letter encouraging 90-day utilization were created: one letter encouraged utilization of 90-day mail while the other encouraged use of 90-day retail. All clients of the PBM were given the opportunity to participate in the letter campaign. Clients who offered a 90-day retail program could choose either the letter encouraging 90-day retail or the letter encouraging 90-day mail. Clients not offering the 90-day retail program received the letter encouraging 90-day mail.

Enrollment for the letter campaign occurred between April and October 2004, and letters were distributed in several batches during this time period. Retrospective review of prescription claims for one month pre- and one month post- distribution of the letters was performed for all participating clients. The percent of total prescriptions filled as 90-day mail, 90-day retail, and 30-day retail within each letter group were compared between the pre- and post-periods. Data is currently being collected and analyzed. Results will be presented at the Great Lakes Residency Conference.

Learning Objectives:

Determine the overall impact of a mailed letter campaign on increasing member utilization of 90-day prescription fills.

Compare the effectiveness of a letter encouraging 90-day mail use with a letter encouraging 90-day retail use.

Self Assessment Questions:

1) True or False: A mailed letter campaign can significantly impact patients' prescription filling habits.

2) True or False: A mailed letter campaign is equally as effective in encouraging 90-day mail utilization as it is in encouraging 90-day retail utilization.

IMPLEMENTATION OF A PERSONAL DIGITAL ASSISTANT DOCUMENTATION SYSTEM IN AN ACADEMIC AMBULATORY CARE SETTING

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Purpose: The role of the pharmacist in academic and clinical practice settings has greatly evolved in recent years. Further progression of the profession requires improved methods of clinical intervention documentation. The importance of documentation should be addressed in pharmacy school curriculums to enable the development of a routine that will be carried into professional careers. Along with verification of the clinical impact of pharmacists, documentation also provides a method to report financial value of the interventions. In comparison to traditional methods of documentation, the use of personal digital assistants (PDAs) is a more efficient and convenient method.

Methods: Ferris State University pharmacy students and residents provide clinical pharmacy services in an academic ambulatory care setting which served as the site for implementation of the project. Two pharmacy students and three residents were provided a PDA to track interventions during the two months they provided services to the clinic. Each PDA contained an identical data collection form authored with PenDragon® software. Interventions were entered into the PDA concurrent with the patient visit. Data from the PDAs was downloaded weekly into a Microsoft Access database to allow for pharmacy student evaluation and to identify educational topics for the medical residents. The collection of interventions was also analyzed for financial impact.

Results: The development of the documentation tool is complete. Pharmacy students and residents are currently utilizing the PDA documentation program in their interactions at the ambulatory care clinic.

Conclusion: This method of documentation is expected to allow the pharmacy preceptors and academic clinic to evaluate the benefit of pharmacy students and residents. In addition, this project affords pharmacy students and residents early exposure to a new method of clinical documentation. Analysis of pharmacy services and preliminary results on the financial impact of pharmacy interventions are anticipated by April 2005.

Learning Objectives:

Understand the importance of documentation to the profession of pharmacy.

Identify the advantages of using PDAs for documentation in an academic ambulatory care setting.

Self Assessment Questions:

True or False: Documentation through a PDA based program is a convenient and time saving method.

True or False: The financial value of pharmacist interventions is often underestimated.

USE OF FOCUS GROUPS TO IDENTIFY MEDICATION THERAPY MANAGEMENT SERVICES IN A COMMUNITY PHARMACY PRACTICE SETTING

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Purpose: In 2006, legislation will establish a mechanism allowing for Medicare reimbursement for pharmacist-provided Medication Therapy Management Services (MTMS). Implementation of a successful MTMS program requires careful identification of what patients expect and what will be perceived as adding value to their health. Published literature reveals that focus groups are a successful means of obtaining information related to community-based interests in pharmacy services. The purpose of this project is to obtain feedback that will be used to identify clinical services provided in a community pharmacy practice setting.
Methods: Following review and approval by an affiliated IRB, stakeholder-specific focus groups will be conducted to determine areas of interest in pharmacy services from four individual groups: patients, non-pharmacy healthcare providers, pharmacists, and employers. One hour focus sessions will be moderated by a non-project affiliated, university-based pharmacist. All focus group sessions will be audio recorded to allow for review of discussions. Questions asked in the focus groups will relate to what services the participant believes already exist in pharmacies, what services the participant would like to see, and what financial contribution the participant would be willing to pay for the service. The goal is to include at least 10 participants in each of the four groups. All focus groups will be conducted within 10 weeks to ensure a consistent basis for input.
Results: To date, the pharmacist focus group has been conducted. Three more focus groups are scheduled and will be completed by March 15, 2005. Collected data will be analyzed for intra-group and inter-group consistency.
Conclusion: Results will be used to identify new pharmacy services offered in a community pharmacy setting. It is also expected that individuals participating in the focus sessions will leave the group formats with an enhanced understanding of the future direction of community-based pharmacy services.

Learning Objectives:

Identify areas of interest in pharmacy services among patients, healthcare providers, and employers.

Discuss the impact of financial viability on medication therapy management services provided in a community pharmacy setting.

Self Assessment Questions:

It is valuable to obtain information from several different perspectives when contemplating offering a new pharmacy service (T/F).

Focus groups have been used in the past as a means for gathering information on pharmacy services in a community setting (T/F).

DESIGN AND IMPLEMENTATION OF A CREDENTIALING AND PRIVILEGING MODEL FOR AMBULATORY PHARMACISTS

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Objective: Due to a trend towards pharmaceutical care, pharmacists have adapted to a more patient-centered, clinical role. This trend has resulted in pharmacists providing care independently under established protocols with indirect physician supervision. As a result of this increase in responsibility, integrated health-care systems must ensure their pharmacists are well-trained and competent to perform these services. Credentialing and privileging programs provide pharmacists and their employers with added protection if liability issues arise. It also encourages ongoing competence in the specialized area and may help provide the documentation required for reimbursement. The objective of this project was to implement a credentialing and privileging process for ambulatory pharmacists.

Methodology: The credentialing process for nursing and medical staff, as well as the credentialing process for pharmacists at other institutions was reviewed and adapted to fit our department's needs. A literature search of the current credentialing programs was performed. Pharmacists working in the anticoagulation, pain management and anticonvulsant clinics were the pharmacists credentialed and have specific privileges to provide certain patient care services. Some of these privileges had already been determined with established protocols. An application was completed by each of the pharmacists and reviewed by a credentialing committee. The application included elements such as practice site information, education, residency or other post-graduate training, and professional licensure. Applicants also submitted a letter of reference, SOAP Note documentation, and calculations where applicable. These pharmacists will be required to renew their credentials and privileges every two years through a reapplication process. The reapplication process will include a continuing education requirement in their specialized area.

Learning Objectives:

Differentiate between credentials, credentialing, and privileging.

Recognize both the challenges and rewards associated with the implementation of a credentialing and privileging process for pharmacists.

Self Assessment Questions:

True or False: Credentialing and privileging of pharmacists may result in added protection if liability issues arise and possibly aid in reimbursement.

True or False: Credentialing is the process by which an organization or institution obtains, verifies, and assesses a pharmacist's qualifications to provide patient care services.

EVALUATION AND MANAGEMENT CONSIDERATIONS OF HYPERLIPIDEMIA IN RENAL ALLOGRAFT RECIPIENTS

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Background: Despite improved management strategies in solid organ transplant, renal allograft recipients (RAR) still face an increased risk of death from cardiovascular disease, which is the number one cause of death after 1-year post transplantation. Dyslipidemia is highly prevalent in patients with chronic kidney disease and occurs in up to 60% of RAR, which predisposes RAR to cardiac disease. Management of hyperlipidemia with minimalization of drug interactions with immunosupressants (IS) in this patient population is necessary to improve morbidity and mortality. However, there is limited data on optimal lipid goals for RAR.
The primary objective of this study is to evaluate the degree of achievement of National Cholesterol Education Program/ National Kidney Foundation guidelines for cholesterol goals. The goals are: total cholesterol <200mg/dl, LDL cholesterol<100mg/dl, and triglycerides<200mg/dl in RAR treated with anti-hyperlipidemic therapy. The tolerability and number of adverse events from anti-hyperlipidemic regimens and the number of patients experiencing a cardiac event will be evaluated.
Methods: The medical records of 117 adult, RAR from 4/1/2002 to 9/27/2004 will be reviewed. Data on patient demographics, co-morbidities including diabetes and Hepatitis C status, date of transplant, number of rejections, date of death/graft loss, induction therapy, IS regimen, IS levels, anti-hyperlipidemic therapy, and the following laboratory data: total cholesterol levels, LDL, HDL, triglycerides, liver function tests, and creatine phosphokinase collected at time points 0, 3, 6, 12, 18, and 24 months post transplant. Further retrospective chart review will be conducted to investigate reported adverse events.
Results/Conclusions: Data collection is ongoing and results will be presented at the Great Lakes Residency Conference.

Learning Objectives:

To identify the immunosuppressive medications and patient characteristics associated with the development of post transplant hyperlipidemia.

To identify treatment strategies for hyperlipidemia management in renal allograft recipients.

Self Assessment Questions:

True or False: Tacrolimus causes a more significant increase in triglycerides than sirolimus.

True or False: Titrating statin doses to effect is difficult due to drug-drug interactions and development of adverse events.

STABILITY OF AN EXTEMPORANEOUS ALCOHOL-FREE PHENOBARBITAL SUSPENSION

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Phenobarbital is used for a variety of conditions in the pediatric population. However, the currently available commercial liquid formulation contains 14% v/v alcohol. Concern has been raised by the American Academy of Pediatrics in regards to the alcohol content of various products. They have recommended over-the-counter liquid preparations contain no more than 5% v/v ethanol due to the risk of harmful CNS side effects. In our institution, current practice involves the dilution of the intravenous phenobarbital formulation with 0.9% NaCl to produce a 10 mg/mL product which can be given orally. This diluted product is given automatically to children under the age of one to reduce the amount of alcohol consumed. Unfortunately, this diluted product is not easily available to patients once they are discharged. We propose to formulate an alcohol-free phenobarbital suspension and determine the stability of this product over a 90-day period.

This study is a stability determination study for an extemporaneously prepared alcohol-free phenobarbital suspension. The suspension will be prepared using phenobarbital tablets and appropriate suspending and flavoring agents. Additionally, a sugar-free, alcohol-free phenobarbital suspension will be prepared. The intended final concentration of the phenobarbital suspension will be 10 mg/mL to provide accurate dosing throughout a wide range of weight-based dosing. Three bottles of each suspension type will be stored at room temperature. The concentration of phenobarbital in each of the suspensions will be determined in duplicate using a stability-indicating HPLC assay immediately after preparation and at 15, 30, 60, and 90 days. The stability of each phenobarbital suspension will be determined by evaluating the mean percent of the initial concentration remaining at each time interval for three samples. Stability of the product will be defined as retention of at least 90% of the initial concentration. Results will be analyzed and presented at the Great Lake Conference.

Learning Objectives:

Identify concerns with the addition of alcohol to common pediatric medications.

Identify the need for an alcohol-free phenobarbital suspension.

Self Assessment Questions:

What are the concerns for use of alcohol-containing products in the pediatric population?

What extemporaneous preparation is proposed to eliminate the consumption of alcohol in a common antiepileptic medication for pediatric patients?

STABILITY AND COMPATIBILITY OF INTRAVENOUS MYCOPHENOLATE MOFETIL WITH OTHER COMMONLY USED INTRAVENOUS DRUGS IN THE IMMUNOSUPPRESSED PATIENT

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Purpose

The stability and compatibility of mycophenolate mofetil (Cellcept®, MMF) was tested over a 24-hour period with other intravenous solutions commonly used in the immunosuppressed population.

Methods

The physical compatibility of MMF was tested by visual appearance and stability-indicating High Performance Liquid Chromatography (HPLC) method with other drugs at 0 to 5 minutes, 1 hour, 12 hours, and 24 hours. MMF was prepared in a poly-vinyl chloride bag at a concentration of 6 mg/mL and admixed with another drug at common clinical concentrations in 6 glass test tubes at a 1:1 ratio. Half of the test tubes were used to look for visual incompatibility and the remaining were used to test chemical stability. Visual incompatibility was defined as any visible particulate matter, color change, or gas evolution. MMF was defined as chemically stable if no less than 90% of the initial drug concentration remained in the admixtures.

Results

To be presented at the Great Lakes Pharmacy Residency Forum in 2005.

Conclusion

Many immunosuppressant drugs lack compatibility data that could decrease a patient's risk of infection, workload to health care professionals, and overall cost to the patient. It is our goal to provide compatibility information for MMF that will allow the ability to co-infuse other necessary intravenous drugs through Y-site administration without the concern of risk to the patient.

Learning Objectives:

Understand how to interpret HPLC analysis

Determine compatibility information for MMF

Self Assessment Questions:

Lack of compatibility data for drugs can increase workload to health care professionals. (True/False)

MMF is compatible with normal saline. (True/False)

SILDENAFIL CITRATE THERAPY FOR PULMONARY ARTERIAL HYPERTENSION IN A PEDIATRIC POPULATION: A RETROSPECTIVE REVIEW.

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Pulmonary arterial hypertension (PAH) is defined as a sustained elevation of mean pulmonary arterial pressure of > 25mmHg, with a mean pulmonary-capillary wedge pressure or left atrial pressure < 15mmHg. Although the true annual incidence of PAH is unknown, it is estimated that over 100,000 people in the United States suffer from PAH. Pulmonary hypertension is a hemodynamic abnormality of diverse etiology and pathogenesis. It may be an idiopathic process, previously called primary pulmonary hypertension, or it may be secondary to various disease processes. Three major pathways interact to maintain proper pulmonary circulation and flow: the endothelin pathway, the nitric oxide pathway, and the prostacyclin pathway. An imbalance contributes to the development of PAH. In addition to the prostacyclin derivatives, which act to enhance vasodilation at the pulmonary circulation, and the endothelin receptor antagonists, which act to block vasoconstriction at the pulmonary circulation, new therapies need to be explored. Otherwise, if left untreated, the median life expectancy is 2.8 years from diagnosis with the majority of patients dying within 5 years despite current treatment regimens. Nitric oxide and phosphodiesterase type V inhibitors are both being examined to enhance vasodilation through the nitric oxide pathway. Sildenafil citrate, a phosphodiesterase type V inhibitor, leads to the enhancement of nitric oxide effect by blocking the enzyme responsible for the breakdown and elimination of cyclic guanosine monophosphate (cGMP), therefore causing the accumulation of cGMP and leading to vasodilation at the pulmonary arteries. A retrospective chart review will be conducted of all patients at our institution who received sildenafil citrate for management of PAH. The purpose is to determine the appropriate dose and schedule for the initiation of sildenafil citrate therapy for pulmonary arterial hypertension in a pediatric population. Preliminary results will be presented at the Great Lakes Pharmacy Residency Conference in April, 2005.

Learning Objectives:

To determine the appropriate dose and schedule for the initiation of sildenafil therapy for pulmonary arterial hypertension in a pediatric population.

To gain knowledge and experience with the sildenafil citrate oral suspension utilized at our institution.

Self Assessment Questions:

Please describe the pathophysiology of pulmonary arterial hypertension in a pediatric population.

Please describe the role of sildenafil citrate therapy in the management of pulmonary arterial hypertension.

EVALUATION OF PATIENT AND PROVIDER SATISFACTION WITH A PHARMACIST MANAGED LIPID CLINIC AT A VETERAN HOSPITAL

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Purpose: Studies have demonstrated that lowering cholesterol reduces the risk of heart disease, occurrence of myocardial infarction, and cardiovascular mortality. The National Cholesterol Education Program (NCEP) developed the Adult Treatment Panel III (ATP III) guidelines to determine cholesterol goals based on individual risk factors. The Louis Stokes VAMC initiated a pharmacist managed lipid clinic in August 2003 to improve achievement of these goals. The objectives of this study are to assess patient and provider satisfaction with a pharmacist managed lipid clinic as well as the percentage of patients achieving LDL goal.

Methods: All patients referred to the managed lipid clinic for management were mailed a questionnaire addressing overall satisfaction with care, printed information and brochures, understanding of lifestyle modifications and cholesterol lowering medications, pharmacist courtesy, and telephone clinic procedures. Chart reviews were performed on patients completing the questionnaire to assess age, gender, lipid lowering medications used, cholesterol panel before referral, most recent cholesterol panel, LDL goal, referring provider, and reason for referral. Additionally, providers referring patients to the lipid clinic were sent an anonymous electronic questionnaire to assess provider satisfaction with the clinic. The questionnaire addressed number of patients referred to the clinic, satisfaction with overall care, assessment of progress notes written, satisfaction with patient monitoring, time to consult completion, and willingness to refer additional patients. All questionnaire answers were given a 1-5 value (Strongly agree=5, Somewhat agree=4, Neutral=3, Somewhat disagree=2, Strongly disagree=1). The median score and number of patients or providers selecting each answer will be determined. Analysis of cholesterol lowering medications used, changes in total cholesterol, LDL, HDL, and triglycerides, and number of patients reaching LDL goal will also be performed.

Results: 105 of 224 (47%) patients and 49 of 109 (45%) providers completed the questionnaires.

Conclusions: To be determined upon data analysis completion.

Learning Objectives:

State the guidelines and the importance of achieving NCEP ATP III LDL goals.

Describe how a pharmacist managed lipid clinic may improve achievement of these goals.

Self Assessment Questions:

T or F Acheivement of individual patient's NCEP ATP III LDL goal decreases risk of cardiovascular disease but not mortality.

T or F There is data to support that pharmacist managed lipid clinics can improve acheivement of cholesterol goals.

IMPLEMENTATION OF A FLUOROQUINOLONE-RESTRICTION PROGRAM IN THE INPATIENT SETTING.

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Current national guidelines exist for the treatment of many infectious disease states, including community-acquired pneumonia (CAP) and urinary tract infections (UTI). Fluoroquinolones are suggested options for empiric treatment in both CAP and UTI, and historically have been highly effective choices. However, over the past decade surveillance programs have documented significant reductions in in vitro susceptibilities of both Gram-negative and Gram-positive bacteria to the fluoroquinolone class. Most concerning is the increasing resistance of serious Gram-negative nosocomial pathogens, i.e. Pseudomonas aeruginosa, which nationally has a current susceptibility of ~65%. Escherichia coli and Proteus species have also seen noteworthy fluoroquinolone-resistance develop. Data is emerging indicating that important Gram-positive bacteria, such as Streptococcus pneumoniae, are also developing mechanisms of fluoroquinolone resistance.

The goal of this project is to evaluate the need for restriction of fluoroquinolone use at Bronson Methodist Hospital given current prescribing habits in light of both national guidelines and decreasing bacterial susceptibilities. Appropriate ICD9 codes will be used to identify patients in Bronson's electronic medical record system that have been hospitalized over a thirty-day period for CAP and simple UTIs. There will two study groups: those diagnosed with CAP who received levofloxacin and those diagnosed with a simple UTI who received levofloxacin. Provider documentation, if existing, will be reviewed to determine rationale for using levofloxacin in treating each case of CAP or UTI. A set of criteria will be developed and implemented which shall restrict fluoroquinolone use; a second thirty-day audit will be performed at a date yet to be determined to assess prescriber compliance.

Learning Objectives:

Identify and review important factors contributing to the need for improved management of the fluoroquinolone class of antibiotics.

Describe the implimentation of an in-house fluoroquinolone-restriction program.

Self Assessment Questions:

List current first-line options for treating community-acquired pneumonia per national guidelines.

Nosocomial Pseudomonas aeruginosa resistance to the fluoroquinolones nationwide is approximately 10%. T/F

EVALUATION OF ANTIBIOTIC UTILIZATION IN TRAUMA PATIENTS WITH EARLY BACTEREMIA

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Background
The threshold for obtaining blood cultures in intensive care unit (ICU) patients is generally low. A study of trauma and surgical ICU (SICU) patients reported 32% of patients having at least one set of blood cultures drawn, and of these only 7.5% were positive, and only 4% represented true bacteremia. Another trial in SICU patients demonstrated that the results of positive cultures did not significantly influence the course of therapy as compared to those patients with negative culture results. The purpose of this study is to analyze antibiotic utilization in trauma patients with a documented bacteremia within the first five days of injury as compared to those trauma patients with a negative blood culture result.

Methods
This study is a retrospective, observational chart review. The list of patients meeting the inclusion criteria was assembled from the 2002 and 2003 Methodist Hospital Trauma Registry. Inclusion criteria included: admission to the ICU, ages > 18 years, and blood cultures within the first five days of trauma. Data collected included: patient age, gender, APACHE II score, ISS score, blood product infusions, venous access, blood culture results, initiation and duration of antibiotic therapy, ICU and hospital LOS, disposition, and documented tissue source of infection. Included subjects were separated into two groups: those with positive and those with negative blood culture results within the first five days of trauma.

Results/Conclusions
Three hundred thirty-one subjects were included in this study. Two hundred ninety-six patients represented 707(94%) negative culture results, while 35 patients represented 45(6%) positive results. Data analysis in progress.

Learning Objectives:

Identify the most commonly isolated contaminant organism amongst critically ill patients

Identify appropriate opportunities for obtaining blood cultures in trauma patients

Self Assessment Questions:

What is the incidence of contaminant blood cultures in the critical ill patient
a. 20%
b. 30%
c. 50%
d. 5%

T/F All trauma patients require empiric antibiotic coverage upon first febrile episode

ASSESSMENT OF CURRENT CONGESTIVE HEART FAILURE (CHF) TREATMENT AND DEVELOPMENT OF HEART FAILURE GUIDELINES FOR USE AT UNIVERSITY OF LOUISVILLE HOSPITAL

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Introduction: CHF affects more than three million individuals in the United States alone and more than 400,000 new cases present each year. Approximately 30-40% of these patients are hospitalized annually accounting for 5-10% of all hospital admissions in the United States. In 2004 the estimated cost of congestive heart failure is $25.8 billion dollars.

Purpose: The purpose of this project is to evaluate current treatment of heart failure and to develop CHF treatment admission and discharge order-sets to aid in optimizing patient care.

Methodology: One hundred charts were reviewed to determine length of hospital stay, re-admission rates and CHF management based on the New York Heart Association and the American College of Cardiology guidelines. Pharmacy representatives participated in the multi-disciplinary development of admission and discharge order sets for use at University of Louisville Hospital.

Results: CHF patients had an average age of 52 with an average length of stay of 5 days and 55% of the patients fell in NYHA classification III or IV but only 2% had medical record documented NYHA class. Only 12% of patients were counseled to monitor weight, 80% counseled to follow a salt-restricted diet, and 23% to exercise. The four JCAHO indicators including discharge instructions, LVEF documentation, ACEI at discharge for LVSD and smoking cessation were evaluated. Percentages were 26, 76, 74, and 26 respectfully. Discharge medications were also evaluated. Data from University of Louisville Hospital were above national trends for utilization of ACEI, beta-blockers, aspirin and “statins” but were less than national trends for diuretics, nitrates, and digoxin. Pneumococcal vaccinations were reviewed and 10% had documented vaccination previously or received vaccination in-house.

Conclusions: Standardized admission and discharge order-sets were developed improve treatment and education of heart failure patients.

Learning Objectives:

Explain the importance of appropriate management of congestive heart failure patients.

Discuss the components of admission and discharge order sets for congestive heart failure.

Self Assessment Questions:

True or False: CHF accounts for only a small percentage of hospitalized patient's (<2%).

True or False: All patients without contraindications should receive pneumococcal and yearly influenza vaccinations.

IMPLEMENTATION OF AN INTRAVENOUS INSULIN INFUSION PROTOCOL IN THE MEDICAL INTENSIVE CARE UNIT

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Objective: A large randomized controlled trial conducted in a surgical intensive care unit demonstrated that using an intravenous insulin infusion protocol to provide strict control of blood glucose (goal range 80-110mg/dl) reduced mortality, septicemia, days on mechanical ventilation, and time in the intensive care unit compared to conventional treatment (goal level between 180-200mg/dl). An insulin infusion protocol has been developed for the medical intensive care unit at the Cincinnati VAMC. This protocol has been designed to provide safe and effective administration of continuous intravenous insulin through standardized recommendations for dosing and monitoring blood glucose. The goal range of glucose control for this protocol is 80-110mg/dl based on information pulled from previously done studies. The objective of this study is to determine if this insulin protocol is effective in achieving goal glucose levels by comparing glucose levels pre-protocol implementation to levels post-protocol implementation.

Methodology: This is a retrospective chart review of the electronic medical records of 24 study patients in the MICU who have received an insulin infusion. Patients will be identified by the use of a continuous insulin infusion via computerized pharmacy records. All patients having received a continuous insulin infusion will be included with the exception of patients being treated for diabetic ketoacidosis or hypertonic hyperglycemic non-ketotic coma as per protocol. Patients blood glucose levels will be collected, and the overall mean and interquartile range will be calculated pre and post-protocol. The level of glucose control will be compared between the patients receiving insulin infusion under the protocol and those receiving the infusion prior to the protocol with the use of a one-sided unpaired student T-test.

Results: Data is currently being collected.

Learning Objectives:

To understand the significance of strict control of blood glucose in the intensive care setting.

To list the difference in blood glucose goals between conventional and intensive insulin infusion therapy

Self Assessment Questions:

True or False. Intensive insulin therapy has been shown to decrease mortality, time in intensive care unit, and days on mechanical ventilation.

True or False. Intensive insulin therapy would be expected to decrease staff (physician, pharmacist, nurse, etc.) time associated with achieving goal glucose levels.

IMPLEMENTATION AND EVALUATION OF ADHERENCE TO ADULT AGITATION GUIDELINES FOR INTENSIVE CARE UNIT (ICU) PATIENTS

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PURPOSE:
Evaluate baseline agitation management in Adult ICU mechanically ventilated patients; implement and assess adherence to institutional agitation guidelines.

BACKGROUND:
Approximately 70% of ICU patients suffer from agitation resulting in undesirable outcomes such as an increase in length of stay. Sedation, analgesia and neuroleptics are important components of agitation management. SCCM published Agitation Management Guidelines focusing on sedation, analgesia, and delirium management in January 2002. William Beaumont Hospital is a 1,064-bed tertiary care, teaching, research and referral hospital with four adult ICUs (2 SICUs, MICU, CCU). A multidisciplinary committee was established to develop institutional Agitation Management Guidelines in an effort to standardize agitation practice and ensure the practice of evidence-based medicine in all ICUs. Several perceived areas of concern with respect to analgesia, sedation and delirium management were identified. Analgesic concerns pertain to appropriate initial analgesic choice. Sedation concerns involve inappropriate propofol use, inappropriate titration of lorazepam infusion, inappropriate maintenance use of midazolam or diazepam and lack of bedside sedation score charting. Delirium management concerns pertain to the consistency of obtaining baseline and daily EKG tests and normalizing electrolytes. Implementing and evaluating adherence to these guidelines will help address our areas of concern.

METHODS:
This is a single center, observational study that consists of 3 phases. Phase 1 is a retrospective review of baseline agitation management from 9/05/04 through 10/31/04. Phase 2 (11/04) consists of guideline implementation which includes multiple and repeated nursing, pharmacist, and medical resident inservices. Phase 3 (01/05) is a prospective evaluation of guideline adherence. Fifty consecutive, mechanically ventilated patients receiving sedation and analgesia with or without haloperidol in both the SICU and MICU will be evaluated in phase 1 and phase 3.

RESULTS/CONCLUSIONS:
Guidelines have been implemented, and data collection is ongoing and will be presented at Great Lakes Pharmacy Practice Resident Conference.

Learning Objectives:

Become familiar with key concepts of agitation management in mechanically ventilated adult critically ill patients.

Understand the appropriate uses of propofol.

Self Assessment Questions:

TRUE OR FALSE:
When haloperidol is used for delirium management it is recommended that patients should be monitored for QTc prolongation.

Which one of the following indications in not an appropriate use of propofol:
1) Treatment of elevated ICP
2) Bridge to extubation
3) When rapid sedation is needed
4) Prolonged QTc when Haldol may be undesireable

THE SAFETY OF ALBUTEROL, SALMETEROL AND FLUTICASONE IN PREGNANCY

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Background: Severe uncontrolled asthma may cause both maternal and fetal morbidity and mortality. Patients thereby require treatment during pregnancy. Although there is the potential for risks with the use of medications during pregnancy, the known risks of uncontrolled asthma are far greater than the known risks associated with asthma medication use. Numerous studies found no adverse effects associated with using beta-2 agonists during pregnancy. There is minimal data evaluating the use of fluticasone, salmeterol, or the combination of salmeterol plus fluticasone during pregnancy.

Purpose: To evaluate the safety and efficacy of albuterol alone compared to albuterol with fluticasone or salmeterol/fluticasone (Advair®) in pregnant patients.

Methods: A retrospective chart review of pregnant patients with asthma who were treated with albuterol alone, albuterol plus fluticasone, or salmeterol/fluticasone (Advair®) was conducted. Asthma course and perinatal outcome variables were then recorded.

Results: A search of medical records identified 373 patients with treated asthma. 10 patients using salmeterol/fluticasone met the inclusion criteria. 10 patients using albuterol alone and 10 patients using albuterol plus fluticsone were identified and were included in separate groups for comparison. No differences between the three groups were evident. Birth weight, gestational age at delivery and mean Apgar scores at one minute and five minutes were 3230 grams, 39 weeks, and 8 and 9 respectively. All patients experienced similar increases in the severity of asthma symptoms, requiring an increase in medication use and close monitoring. Inhaled corticosteroids, ß-2 agonists, or their combination did not appear to affect perinatal outcomes.

Conclusion: Although this study did not detect a significant difference between the study groups, the findings support the hypothesis that uncontrolled asthma poses greater risks than the risks associated with asthma medication use during pregnancy. A prospective, randomized, placebo controlled trial is warranted to determine the absolute safety of these agents.

Learning Objectives:

To determine when combination therapy is warranted for pregnant, asthmatic patients.

To compare the safety and efficacy of monotherapy with short-acting beta-2 agonists with combination therapy of long-acting beta-2 agonits and inhaled corticosteroids through evaluation of outcome vaiables.

Self Assessment Questions:

When should an inhaled corticosteroid be added to the medication regimen of a pregnant, asthmatic patient?

List 3 known risks associated with uncontrolled asthma during pregnancy.

DEVELOPMENT OF A NEW PHARMACY SERVICE IN AN EMERGENCY DEPARTMENT

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Purpose:
As the responsibilities of a clinical pharmacist expand to provide patient care to all patients in the hospital, it becomes increasing important to identify patients who may need immediate pharmaceutical care. Under varying circumstances, some patients admitted through the emergency department may not receive the benefit of services provided by a clinical pharmacist for many hours. The purpose of this project is to develop a new pharmacy service that provides immediate pharmaceutical care to patients admitted to the hospital through the emergency department (ED).

Methods:
Patients admitted to the hospital through the ED will be evaluated for pharmaceutical care interventions including: Untreated indications (DVT prophylaxis), treatment without an indication (over utilization of proton-pump inhibitors), improper drug selection (inappropriate antimicrobial use), sub/supertherapeutic dosages (dose adjustment in renal insufficiency), adverse drug reactions, drug-drug/food/disease state interactions and medication history reconciliation. There will be a 4-week period of data collection to measure patient interventions and potential cost savings to the hospital. Patient data and intervention type will be collected on pre-developed monitoring sheets. A cost savings analysis comparing a matched patient population to the intervention group will be performed. In addition, an estimate of cost savings and cost avoidance based on published studies will be completed.

Results:
Data collection will take place in March.

Conclusion:
We intend to prove that the implementation of a clinical pharmacist in our ED will decrease patient adverse outcomes and cost of care by the provision of immediate pharmaceutical care services.

Learning Objectives:

After attending this lecture, the attendee will be able to describe the cost saving measures used to justify the additional cost of a new ED pharmacist position.

After attending this lecture, the attendee will be able to discuss the patient care benefits derived by the new pharmaceutical services in the ED.

Self Assessment Questions:

The most common reconciliation discrepancy found by Gleason et al was:
1. Complete Omission
2. Incorrect Dosage

Fraser et al noted a cost savings in patient antibiotic charges after antibiotic optimization of:
1. $55
2. $400
3. $4000

DOES ORAL LORAZEPAM SHORTEN LENGTH OF STAY IN MECHANICALLY VENTILATED PEDIATRIC INTENSIVE CARE UNIT PATIENTS?

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IV benzodiazepines (BDZ) are used for the sedation of mechanically ventilated pediatric patients in the intensive care unit (ICU). Protracted weaning from mechanical ventilation may significantly increase ICU length of stay (LOS). The costs associated with ICU stays are well documented and may be as high as $ 2000.00 per day. In our institution, the pediatric critical care specialist, as a standard of care, routinely converts patients weaning from mechanical ventilation receiving IV midazolam to oral lorazepam based on the patients' ability to tolerate oral medications. This practice was first reported by Lugo et al. (Critical Care Medicine 1999) who conducted a study on 30 pediatric ICU patients requiring mechanical ventilation and reported an estimated savings of $47867.00 per 30 patients. Cost savings in terms of LOS associated with this conversion have not been previously reported.
Patients undergoing cardiothoracic (CT) surgery routinely require mechanical ventilation and have longer LOS in the PICU (up to 12 days) in our institution. We propose to document the cost savings in terms of LOS in this population from our current practice of converting of IV midazolam to oral lorazepam.

Methods:
A case-control study will be conducted. Retrospective controls will be identified through pharmacy databases. Prospective cases will be identified through daily inspections of the PICU. Data collected on all subjects include: demographics, past medical history, dose (mg) of IV midazolam, dose (mg) of oral lorazepam, length of PICU stay, length of mechanical ventilation, dose of opioid(s) received in past 24 hours, signs/symptoms of BDZ withdrawal, sedation/agitation as documented per institutional nursing scale. Results will be analyzed and presented at the Great Lakes Conference.

Learning Objectives:

To document the effect on LOS associated with the conversion to oral lorazepam from IV midazolam

To assess the safety of oral lorazepam when used for weaning from mechanical ventilation in CT surgery pts

Self Assessment Questions:

True or False. Oral lorazepam is not a suitable BDZ for use in weaning mechanically ventilated pediatric ICU patients

True or False. BDZ do not cause withdrawal symptoms in pediatric patients

UTILIZATION OF THE TRIGGER TOOL METHODOLOGY TO DECREASE INSTITUTIONAL ADVERSE DRUG EVENTS ASSOCIATED WITH ANTICOAGULATION

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Background: Reporting of harmful adverse drug events (ADEs) is a key concern for the health care community. Research estimates that only 10 to 20% of ADEs are reported by traditional methods of chart audits, incident reports, or voluntary reporting. The need for a more accurate and efficient system led the Institute for Healthcare Improvement (IHI) to develop the Trigger Tool Methodology. This method uses specific triggers documented in the chart to alert healthcare workers of a potential ADE occurrence. Heparin and warfarin have been identified as high-risk medications associated with preventable ADEs and are therapies targeted within our institution for the application of this new methodology.

Objective: To implement process improvements to reduce ADEs related to anticoagulation by 30%.

Methods: Retrospective chart review utilizing IHI methodology was conducted on a cardiac pilot unit from July 2004 through September 2004. From the baseline data collected, the most prevalent triggers identified bleeding as the most preventable ADE. Subsequently, bleeding became the area of focus for process improvements. A multidisciplinary team was formed to develop implementation strategies that will reduce identified ADEs and evaluate the effectiveness of the interventions. Initial efforts to reduce identified ADEs will be targeted educational programs focusing on dosing, administration, monitoring and patient education of anticoagulants provided to the pharmacist and nursing staff. The team will implement one process improvement at a time to determine adequate level of success. The team will measure the impact of the change through monthly chart reviews. Successful process improvements from the pilot unit will be applied in other units within the hospital over time.

The impact of improvements and conclusions will be presented.

Learning Objectives:

To learn the distinction between the traditional methods of chart audit and the IHI trigger tool methodology for reporting ADEs.

Understand the processes involved in the implementation of Trigger Tool Methodology related to anticoagulation in an institution.

Self Assessment Questions:

True/False. Current methods are successful at quantifying the true rate of ADEs.

True/ False. The Trigger Tool Methodology is more effective than traditional methods in identifying events that do not cause harm to the patients

RETROSPECTIVE REVIEW OF VASOPRESSIN AND THE INCIDENCE OF THROMBOEMBOLIC EVENTS

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Vasopressin is used as a continuous infusion in patients with vasodilatory shock to limit the dose of concomitant vasopressors, treat patients with catecholamine resistance, and decrease adverse effects. Vasopressin has been shown to cause platelet aggregation, increase components of the fibrinolytic system, and decrease tissue plasminogen inhibitor. This study will evaluate the potential relationship between vasopressin and the incidence of venous thromboembolism (VTE) in the ICU.

This retrospective study will compare the incidence of venous thromboembolism in Surgical and Medical ICU patients with shock, who received a continuous infusion of vasopressin for hemodynamic support and those who did not receive vasopressin. ICU patients with a diagnosis of shock will be identified using the hospital's Information Warehouse. A total of 400 patients (200 that received vasopressin and 200 that did not receive vasopressin) will be randomly selected. Patients will be included if they received intravenous vasopressin or other catecholamines, were 18 years of age or older, and had a diagnosis of shock during their admission. Patients were excluded if they received vasopressin for gastrointestinal bleeding, esophageal varices, or diabetes insipidus; had preexisting VTE; or received concurrent therapy for SIADH. Patients who received vasopressin alone or vasopressin plus a catecholamine will be included in the vasopressin arm of the study; patients who received a catecholamine or any other combination of catecholamines will be included in the control arm. Demographic data will include age, gender, APACHE II score on admission, risk factors for VTE, presence of DVT prophylaxis, use of systemic anticoagulation, and admission diagnoses. The primary outcome, incidence of VTE will be compared between groups. VTE will be considered present with a positive imaging study (ultrasound, CT scan, angiography) or the treating physicians decision to treat based on clinical findings.

Data collection is in progress and the analysis of results is pending.

Learning Objectives:

To determine the incidence of thromboembolic events related to vasopressin infusions for hemodynamic support in Medical and Surgical ICU patients with a diagnosis of shock.

To determine if a relationship exists between certain risk factors for VTE and the incidence of VTE in ICU patients receiving a continuous infusion of vasopressin.

Self Assessment Questions:

True or False: Vasopressin can cause platelet aggregation, increase components of the fibrinolytic system, and decrease tissue plasminogen inhibitor.

True or False: Vasopressin increases the incidence of VTE in ICU patients with a diagnosis of shock.

EVALUATION OF VANCOMYCIN TOLERANCE IN ISOLATES OF METHICILLIN RESISTANT STAPHYLOCOCCUS AUREUS (MRSA): PREVALENCE AND SUSCEPTIBILITY PATTERNS

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Background

Tolerance is defined as the ability of an organism to survive the cidal effects of an antibiotic; the general definition is an MIC:MBC ratio > 1:32. This phenomenon has been described with cell-wall active antibiotics such as the penicillins against Gram positive organisms and has negative clinical outcomes in specific disease states. Vancomycin tolerance may be prevalent in Staphylococcus aureus, especially among methicillin-resistant strains; however, there is limited documentation in the literature. In addition, the susceptibility patterns of vancomycin-tolerant staphylococci have not been described.

Objective

The objective of this study is to assess the prevalence of vancomycin tolerance in isolates of MRSA at Borgess Medical Center, and to determine the susceptibility of these organisms to 3 alternate antibiotics frequently used against MRSA (trimethoprim/sulfamethoxazole, linezolid, and daptomycin).

Methods

Isolates of MRSA with a vancomycin MIC of ≤ 2 will be collected from November 2004 to January 2005. The anticipated sample size is 30 organisms. Using standard National Committee for Clinical Laboratory Standards (NCCLS) microdilution procedures, MIC testing will be performed for vancomycin, daptomycin, linezolid, and trimethoprim/sulfamethoxazole; MBC testing will then be performed for vancomycin, daptomycin, and linezolid. A MIC:MBC ratio of ≥ 1:32 will define tolerance. ATCC 29213 will be utilized as a control organism per NCCLS guidelines. Statistics will be descriptive only; tolerance will be reported as raw numbers and percentages.

Results/Conclusions

Laboratory analysis is currently being conducted. Results and conclusions to be presented.

Learning Objectives:

Describe the general mechanisms of tolerance in Gram positive organisms.

Explain the difference between the MIC and the MBC of an organism for a given antibiotic.

Self Assessment Questions:

True or False: the general definition of tolerance is a MIC:MBC ratio of ≥ 1:16.

True of False: a vancomycin tolerant isolate will have a MIC in the susceptible range for vancomycin (≤ 4 mcg/mL)

IMPLEMENTATION AND ANALYSIS OF A CONTINUOUS-INFUSION PIPERACILLIN/TAZOBACTAM PROTOCOL

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Background/Objective: Compared to intermittent infusion, administration of piperacillin/tazobactam via continuous infusion has been shown to produce nonsignificant trends toward improvement in both clinical and microbiologic outcomes, as well as a significant decrease in cost of antibiotic therapy. The objective of this study is to implement a hospital-wide conversion from intermittent to continuous infusion of piperacillin/tazobactam and examine the associated clinical and economic outcomes at our institution.
Methods: Following Pharmacy & Therapeutics Committee approval, a hospital-wide, pharmacy-based conversion to continuous infusion of piperacillin/tazobactam was conducted based on each patient's renal function and indication for treatment. All patients received a 2gm piperacillin/0.25gm tazobactam loading dose. Patients with a creatinine clearance (CrCl) >20mL/min who were being treated for non-nosocomial infections received continuous infusion of 8gm piperacillin/1gm tazobactam over 24 hours. Patients being treated for nosocomial infections received 24-hour continuous infusion of either 8gm piperacillin/1gm tazobactam if their CrCl was 20-40mL/min, or 12gm piperacillin/1.5gm tazobactam if their CrCl was >40mL/min. Patients were excluded from this conversion if they met any of the following criteria: <18 years of age, pregnant, neutropenic, or a CrCl <20mL/min. The following data were collected prospectively: daily white blood cell count, serum creatinine, maximum temperature, culture results, other evidence of infection, and concomitant antibiotic therapy. Similar data collection was performed retrospectively for patients who received intermittent infusion of piperacillin/tazobactam over the same time period of the previous year. Cost of therapy for both continuous and intermittent infusion will be calculated based on the acquisition prices of both drug and supplies required for administration. Comparisons in clinical and economic outcomes between the two groups will be drawn in order to assess the true benefit of implementing a continuous-infusion protocol at this institution.
Results: Data analysis is ongoing and will be presented.

Learning Objectives:

Understand the pharmacodynamic rationale for administering piperacillin/tazobactam via continuous infusion.

Describe the clinical and economic outcomes associated with converting to continuous infusion of piperacillin/tazobactam at our institution.

Self Assessment Questions:

The bacterial killing accomplished by piperacillin/tazobactam and other beta-lactam antibiotics is:
a)Concentration-dependent
b)Time-dependent

Which of the following accurately describes the findings of the major trial that examined continuous versus intermittent infusion of piperacillin/tazobactam?
a)Continuous infusion decreased the time to defervescence
b)Continuous infusion significantly decreased costs associated with therapy
c)Intermittent infusion showed better clinical cure rates
d)a and b

EFFECT OF EARLY CESSATION OF NIMODIPINE IN THE TREATMENT OF SUBARACHNOID HEMORRHAGE

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Purpose:
Cerebral vasospasm occurs in 70% of patients following subarachnoid hemorrhage (SAH), complicating the management and outcomes of these patients. The calcium channel blocker nimodipine (Nimotop®) is utilized to help improve neurological outcomes after vasospasm. The recommended duration of treatment with nimodipine is 21 days to be started within four days (96 hours) of the initial bleed.

Nimodipine is frequently discontinued before completion of the full 21-day treatment period due to hypotension, bradycardia, or because vasopressor therapy is initiated to optimize cerebral perfusion. This retrospective study will compare the outcomes of patients experiencing premature nimodipine discontinuation to those of patients who received the recommended 21-day course of nimodipine treatment.

Methods:
This study will be conducted as a retrospective chart review of patients admitted to the Neurosurgical Intensive Care Unit with a diagnosis of SAH and received nimodipine within 96 hours of the SAH. Exclusion criteria will include age less than 18 years, a greater than 96 hour lapse after SAH before initiation of nimodipine, and traumatic SAH. The primary endpoint of this study is the incidence of vasospasm. Secondary endpoints include in-hospital mortality and neurological deficit. Additional parameters that will be collected include reason for nimodipine discontinuation, Fisher Grade, Hunt and Hess Score, Glasgow Outcome Scale (GOS) and Glasgow Coma Score (GCS), length of ICU and total hospital stay, utilization of Triple-H therapy or angioplasty, coiling or clipping of aneurysm, requirement of additional neurosurgical interventions, transcranial Doppler (TCD) readings, blood pressure, heart rate, as well as medications prior to and during admission. Demographics (age, gender, race, weight, height), co-morbidities, tobacco use, and alcohol use will also be collected.

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

Learning Objectives:

Discuss the role of nimodipine in the management of SAH.

Assess the outcomes associated with nimodipine treatment duration less than 21 days.

Self Assessment Questions:

Nimodipine is utilized following SAH to minimize which of the following complications?
A. seizures
B. ischemic deficits
C. high blood pressure
D. rebleed

Vasospasm is defined as:

IMPACT OF CDUR MESSAGING ON THE PHARMACIST'S INTERVENTIONS FOR SELECTED CLINICALLY SIGNIFICANT EDITS

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Introduction:

The goal of concurrent drug utilization review (CDUR) is to promote patient safety and appropriate use of drug therapy. The CDUR process is supported via in-store pharmacy processing systems and prescription benefit managers' (PBM) online claims processing systems. The PBM online system captures medication claims from network pharmacies and provides a comprehensive review of the patient's drug history. Current literature identifies a growing concern with the influx of duplicate messaging between the two systems and the pharmacist's ability to identify clinically significant edits. This study measures pharmacists' actions on high prevalence edits, which present at the point of service.

Methods:

This is a retrospective, cohort study of pharmacists' actions on high prevalence CDUR edits. A review of the PBM adjudicated claims processed in 2nd Quarter 2004 will be performed to identify the number and type of CDUR edits. Sample size will be determined based on power analysis. Medications with clinically significant edits will be chosen in the following categories: drug-drug with high severity, drug-geriatric, maximum dose alerts, and duplicate therapy. Validity criteria will be developed to define the occurrence of pharmacists' interventions resulting from CDUR edits. Multivariate regression model will be utilized for additional assessment. Results will be analyzed and presented at the Great Lakes Conference.

Learning Objectives:

To determine the proportion of clinically significant CDUR edits that result in a pharmacist intervention at the point of sale.

To identify the pharmacists responses to the clinical significant CDUR edits and validate whether the intervention is resultant of the online programming.

Self Assessment Questions:

What are the advantages of PBM online CDUR programs in relations to appropriateness of drug therapy?

What are recommendations for improving online CDUR programs to streamline the influx of messaging received by the pharmacist?

AN EVALUATION OF PATIENTS WITH TYPE 2 DIABETES FOLLOWED BY A PHARMACEUTICAL CARE CLINIC

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Purpose: In April 2002, the Cleveland Clinic Foundation Pharmaceutical Care Clinic implemented a Medication Management Clinic. This pharmacist-run clinic, which accepts referrals from Internal Medicine physicians, was partially designed to assist in the management of type 2 diabetics. The pharmacist provides patient education, medication adjustment, and monitoring services. The goal of this project is to assess the Medication Management Clinic's impact on glycemic control in type 2 diabetics referred by their primary care physician.

Methods: The primary objective of this retrospective chart review is to evaluate the change in HbA1c in patients with type 2 diabetes after referral to the Medication Management Clinic. Secondarily, the type of patient seen in the clinic will be characterized. Electronic outpatient medical records (EpiCare) were reviewed to identify patients seen in the Medication Management Clinic. Such patients with an initial visit between April 2002 and November 2004 and at least one follow-up visit were evaluated. Additionally, a baseline HbA1c > 7.5 % and a follow-up HbA1c 3-6 months after intervention were required for inclusion. The primary endpoint was the change in HbA1c from baseline to 3-6 months. Characterization of patients was done by collection of baseline demographics, diabetes history, and co-morbidities. A paired t-test with a power of 80% and (alpha) of 0.05 will be used to evaluate the change in HbA1c.

Preliminary Results: Fifty-five patients were included in the analysis (60% male, mean age 60.5 years). The mean HbA1c was 10.1% at baseline and 8.2% after pharmacist intervention, resulting in a mean change in HbA1c of -1.9% (+ 1.8%). Additional results and patient demographics will be presented at the conference.

Learning Objectives:

Describe the current rate of glycemic control for patients with diabetes in the United States

Describe the methodology and results of this investigation and the impact it has on patients with type 2 diabetes

Self Assessment Questions:

Greater than 50% of patients diagnosed with diabetes have a HbA1C less than 7%

Current literature demonstrates that patients who have a pharmacist involved in their diabetes care have a better understanding of their disease state, but do not demonstrate a decrease in HbA1C

ASSESSMENT OF GENTAMICIN EXTENDED INTERVAL DOSING IN THE NEONATAL POPULATION

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Gentamicin is used in combination with other antimicrobial agents to treat bacterial sepsis, congenital pneumonia, and other infections associated with common organisms of maternal vaginal flora. High peak serum concentrations of gentamicin for prolonged periods of time are associated with ototoxicity and nephrotoxicity. Desired concentrations include high peaks between 8-10mcg/ml, to ensure an adequate concentration to kill bacteria, and low trough concentrations less than 2mcg/ml, to minimize toxicity. Dosing regimens for aminoglycosides in the neonatal population vary depending upon the maturity of the newborn, MIC of the organism, volume of distribution, and renal function.

In June 2004, extended interval dosing of gentamicin was implemented. This regimen utilizes a weight based dose of 3.5-4mg/kg every 24-48 hours as determined by gestational age, renal function, and population kinetics to maximize efficacy and prevent toxicity. The purpose of this project is to evaluate the current extended interval dosing regimen for therapeutic concentrations and incidence of toxicity. The primary outcome is to evaluate the current extended interval protocol by assessing the number of neonates with therapeutic gentamicin trough and peak concentrations. Secondary outcomes include the number of patients with sub-therapeutic or supra-therapeutic gentamicin concentrations, the incidence of nephrotoxicity/ototoxicity, the number of dose adjustments made based on the concentrations, and the identification of risk factors associated with gentamicin toxicity.

Retrospective and prospective chart reviews were performed from July 2004 through March 2005. Data collection includes demographics, concomitant medications, laboratory parameters assessing infection and renal function, ALGO results, kinetic parameters, the incidence of nephrotoxicity and ototoxicity, and the number of patients who achieved desired therapeutic gentamicin concentrations. Appropriate statistical analysis will be performed on the data.

Results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference. These results will be instrumental in determining whether changes to the current dosing regimen are warranted.

Learning Objectives:

Identify factors that affect gentamicin clearance in the neonate.

Identify the risk of nephrotoxicty and ototoxicity secondary to gentamicin therapy identified in the St. Vincent NICU population.

Self Assessment Questions:

List three factors that affect gentamicin clearance in the neonate and explain how these factors alter gentamicin dosing in the neonate.

True or False: Ototoxicity based on ALGO results was a common adverse event seen in neonates who received extended interval gentamicin dosing at St. Vincent Hospital.

DEVELOPMENT AND IMPLEMENTATION OF A PHARMACEUTICAL CARE ACUITY MODEL IN AN ACADEMIC MEDICAL CENTER

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Background: A major obstacle for pharmacy administration is to accurately match allotted personnel to the increasing demands for pharmaceutical care services. Prioritizing workload and streamlining workflows to meet these demands has been a challenge for pharmacists. A pharmaceutical care classification system would provide an approach to evaluate a patient's need for pharmaceutical care services as an indicator for workload and could assist in daily workflow redesign, analyzing personnel allocation by service area, predicting trends in demands for services, and forecasting the impact of new or expanded services on the budget.

Objective: Develop, validate, and implement a pharmaceutical care acuity model in a 426-bed academic medical center that will place acuity on pharmaceutical care services to facilitate daily workflow redesign and staff scheduling while optimizing the effectiveness, safety, and economic value of pharmacotherapy.

Methodology: The nursing acuity model was used as an example of how a profession can use a patient classification system to balance staffing with patients' needs. Departmental management and staff ideas and a review of current literature identified potential designs for this model and opportunities for pharmacists' interventions in medication management. Medications and patient characteristics were identified and assigned an acuity parameter. The pharmacy computer system will be utilized to generate an acuity score for each patient and provide clinical pharmacists with tools to assist in workflow redesign and workload prioritization. Parameters that may be used to validate the model are length of stay in the hospital, length of stay in the intensive care unit, and drug cost per patient day.

Results: Data collection is ongoing and results will be presented at Great Lakes.

Conclusions: A pharmaceutical care acuity model can assist in prioritizing workload to facilitate and improve daily workflow redesign and staff scheduling. Further evaluation and results will help justify the appropriateness of this model.

Learning Objectives:

Identify how a pharmaceutical care acuity classification system can be utilized to improve daily workflow and assist with assessment of workload.

Identify how a clinical information system can be used to assist in the identification and organization of patients' needs for pharmaceutical care services.

Self Assessment Questions:

A pharmaceutical care acuity model can be used to help clinical pharmacists prioritize workload. T/F

The number of orders per unit is an activity identified that requires significant pharmaceutical care and was assigned an acuity score. T/F

EARLY USE OF NESIRITIDE AND ITS IMPACT ON HOSPITAL RESOURCES

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Purpose:
Congestive heart failure (CHF) is a common condition associated with significant morbidity and mortality. Nesiritide, a beta-type natriuretic peptide, improves hemodynamic and symptomatic effects through vasodilation, neurohormonal suppression, and enhanced natriuresis and diuresis. Previous studies have suggested that the use of nesiritide in decompensated CHF may be associated with decreased healthcare utilization costs. The purpose of this study is to determine the impact of early use of nesiritide on hospital resource utilization in patients with acute decompensated heart failure.

Methods:
All adult patients admitted to the hospital with a primary diagnosis of an acute heart failure exacerbation (based on ICD9 code) at participating institutions were eligible for inclusion to the study. Patients who received nesiritide within 24 hours of triage were termed the nesiritide group. Eligible nesiritide group patients were then case-matched to similar historical patients that did not receive nesiritide, termed the standard therapy group. Case matching was performed based upon age, race, gender, institution, ejection fraction, and renal function at the time of hospital admission.

The primary outcome being assessed is total hospital length of stay. Secondary outcomes include: intensive care unit and emergency department length of stay, total hospital and pharmacy patient charges, 30 day repeat emergency department visits, 30 day hospital readmission, and 30 day mortality. The dosage and duration of inpatient diuretics and vasoactive medications will be reported. Patients in the nesiritide group will also be evaluated for appropriate use based on institutional use-criteria guidelines.

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

Learning Objectives:

Review proper dosing, administration, and monitoring of nesiritide therapy

Discuss the role of nesiritide in the treatment of congestive heart failure

Self Assessment Questions:

In the VMAC trial, nesiritide was compared to _____.
a. Dobutamine
b. Nitroglycerin
c. Milrinone
d. Nitroprusside

The recommended dose of nesiritide is a 2 mcg/kg bolus followed by a 0.01 mcg/kg/min maintenance dose
a. True
b. False

ASSESSING RISK FACTORS FOR CORONARY HEART DISEASE IN PATIENTS ADMITTED TO AN ADULT INPATIENT PSYCHIATRY UNIT.

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Purpose: The leading cause of mortality in the United States is coronary heart disease (CHD). The rates of CHD differ among various patient populations. Our study is designed to investigate whether psychiatric patients are perhaps one of the patient populations that are at an especially high risk of developing CHD. We will assess the prevalence of CHD risk factors in new psychiatric admits, as well as examine whether a difference exists in the prevalence of CHD risk factors when patient subpopulations belonging to different diagnostic categories are compared. A secondary objective will be to determine the proportion of newly admitted in the Adult Inpatient Psychiatry Unit at the University of Michigan who receive the physical and laboratory assessments that are necessary for the clinician to conclude which/to what degree coronary heart disease risk factors are present.

Methodology: This is a retrospective chart review. Charts assessed will include all new admits to the University of Michigan Health System Adult General Psychiatry Unit from July 2003-July 2004 (estimated to be approximately 700 admissions over 1 year). Charts will be reviewed for presence of risk factors for CHD (smoking, BMI>30, diabetes, hypertension, and hyperlipidemia). All medications prescribed within 48 hours of admission will be recorded, with the exception of “as needed” medications. Prevalence of CHD risk factors will be compared using demographic variables such as sex, race, and age, as well as by stratifying patients into psychiatric diagnostic and psychotropic drug group categories. Data will be assessed for significance using chi-squared statistical tests. As this is a study of real-life risk among psychiatric patients, there are no inclusion/exclusion criteria.

Results: In process.

Conclusions: Pending.

Learning Objectives:

List the different risk factors for coronary heart disease and describe their prevalence in the United States.

Identify specific psychiatric medications and disease states which have been shown to increase patient risk for coronary heart disease.

Self Assessment Questions:

Which of the following medications has been shown to have the least detrimental impact on risk factors for coronary heart disease?
a) Valproic acid
b) Lithium
c) Aripiprazole
d) Clozapine

Which antipsychotic medication is least likely to affect metabolic risk factors?
a) Risperidone
b) Olanzapine
c) Haloperidol
d) Clozapine

EVALUATING THE IMPACT OF ROBOT BAR CODE TECHNOLOGY ON FIRST DOSE DISPENSING ERROR RATES AND PHARMACIST SATISFACTION.

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Objective: The medication use system is a complex process and medication errors can occur at any stage. Bar code technology is a standard practice in many industries and is now being used in pharmacy to decrease medication errors. In the University of Wisconsin Hospital and Clinics' decentral pharmacy distribution process, first doses are filled by a pharmacy technician in the central pharmacy and double-checked by a pharmacist decentrally. The objective of this study is to redesign the workflow in central pharmacy by incorporating robot and bar code technology in an effort to improve workflow efficiency, improve first dose medication dispensing accuracy and improve pharmacist satisfaction.

Methods: The study will be divided into two phases. In the pre-implementation phase a system analysis of the central pharmacy's first dose process will be conducted to identify variances and potential sources of error. An audit of the first dose turnaround time, first dose dispensing accuracy and the unit dose cart fill time will be evaluated. Pharmacist time spent checking first doses will be collected through a time motion study. Finally a survey will be conducted to evaluate decentral pharmacist satisfaction with the current first dose process.

In the post-implementation phase, a system analysis of the new first dose process will be conducted to identify new sources of error. The workload of central technicians will be evaluated for potential labor savings. First dose turnaround times, first dose dispensing accuracy and the cart fill time will be reevaluated and compared to baseline data. The percent of first doses dispensed via the robot will be ascertained to estimate the pharmacist time saved. A follow up decentral pharmacist satisfaction survey will be conducted to evaluate any concerns with the new process.

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

Learning Objectives:

Identify areas of variance in a manual first dose system.

Describe issues that may occur when automating the first dose process.

Self Assessment Questions:

True or False – Utilizing centralized robot technology to automate the first dose process will decrease the amount of time pharmacists spend on dispensing activities?

True or False – Utilizing centralized robot technology to automate the first dose process will improve first dose turn around time?

EFFICACY OF HMG-COA REDUCTASE INHIBITORS IN REDUCING SECONDARY CARDIOVASCULAR EVENTS IN ELDERLY PATIENTS WITH CARDIOVASCULAR DISEASE AND DIABETES IN A VA PRIMARY CARE SETTING

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Background: Previous clinical trials have shown that lipid lowering therapy decreases the incidence of coronary events in patients with history of coronary artery disease. New guidelines have reinforced the need to lower LDL in high risk patients to a goal of less than 70mg/dl. Aggressive lipid lowering therapy may translate into prevention of cardiovascular events in high risk patients. Extrapolating the current guidelines to the elderly population may provide additional benefit in this high risk group.

Objective: This study intends to investigate if an LDL goal of less than 70 mg/dl will reduce the incidence of secondary cardiovascular events in high risk elderly patients on statin therapy. A secondary outcome will validate the current NCEP guidelines of an LDL goal of less than 100mg/dl in high risk patients in preventing cardiovascular events.

Methods: The study will be a retrospective chart review. A computerized clinical report will be run to include patients from January 1, 2000 to December 31, 2003. Data will be collected via the computerized medical chart. This study will compare the number of cardiovascular events in three specified patient groups: patients with an LDL less than 70mg/dl, 71 - 100mg/dl , greater than 100mg/dl. The following data will be collected: age, previous cardiovascular events, aspirin therapy, type of statin therapy, on hypertensive medications, and other antilipimics will be collected at baseline. Baseline lipid panel, liver function tests, and hemoglobin A1c will be collected at start of study, and during year 1, 2, and 3 of study. At the end of the study, data on cardiovascular events and adverse drug reactions related to statin therapy will be assessed. Primary outcomes will compare total occurrence of cardiovascular events between the three groups.

Learning Objectives:

Describe the updated 2004 NCEP guidelines.

To identify the risk factors for coronary heart disease under the revised NCEP guidelines.

Self Assessment Questions:

What is the LDL goal for a patient with coronary artery disease with no other risk factors?

What are potential treatment options to lower LDL cholesterol? a) statin therapy, b) nicotinic acids c) fibric acids derivatives d) bile acids sequestrants e) all of the above

THE EFFECT OF PRE-PRINTED PATIENT SPECIFIC MEDICATION TRANSFER ORDERS ON PATIENTS' SAFETY AND PHYSICIAN/PHARMACIST SATISFACTION IN A COMMUNITY HOSPITAL

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Purpose:
In an effort to improve patient safety and comply with the 2006 patient safety standards set by the Joint Commission on Accreditation of Healthcare Organizations, this project will look to improve the current process for reconciling a patient's medications upon transfer within the hospital.

Methods:
Physician and pharmacist satisfaction surveys will be conducted at baseline to assess the current process used to reorder medications when a patient transfers within the hospital. A medication transfer order form will be developed with physician input containing all pertinent patient specific medication order information. Prior to implementation, pharmacists will keep a record of the number of times (by phone or in person) they have to contact physicians to clarify orders. Data will be collected for four weeks before and four weeks after implementation of the transfer order form.
All parties involved in completing this study including nursing, pharmacy staff, physicians, and unit clerks will receive training appropriate to their area of expertise.
Upon transfer, a patient's individual medication list will be printed directly from the hospital's clinical information system. The physician will review this list of medications to determine which will be continued, discontinued, or modified. When completed, the orders will be sent to the pharmacy for processing.
Both physicians and pharmacists will be surveyed a second time when the study period has concluded to assess their satisfaction with the new system. The two data sets will be compared to determine the impact of the new order form on time spent by pharmacists clarifying new orders, satisfaction of the staff, and the potential to improve patient safety.

Results to Date:
All results will be presented at the time of presentation

Learning Objectives:

Describe the impact of a pre-printed medication order form on patient safety and physician/pharmacist satisfaction.

List the advantages of computer generated medication transfer order forms as they relate to patient safety.

Self Assessment Questions:

T or F The implementation of patient specific medication transfer orders can improve patient safety?

T or F Spending less time clarifying hand written medication orders does not free up time for pharmacists to provide more clinical services?

RETROSPECTIVE REVIEW OF THE INCIDENCE OF THERAPEUTIC DUPLICATION IN DISCHARGE MEDICATIONS AND ADVERSE EVENTS AMONG PATIENTS IN A VETERANS AFFAIRS MEDICAL CENTER

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Objectives: The primary objective of this study was to quantify the incidence of duplicate medications among patients discharged from a tertiary referral veterans affairs medical center. Secondary objectives were to determine the incidence and severity of adverse events associated with duplicate medications and to assess the cost of institution resources related to these events.

Methods: A computer generated list of all patients discharged between October 1, 2003 and March 31, 2004 from either the surgical or medical intensive care unit was obtained. Patients were randomly selected and reviewed for study inclusion. Patients were included if they received primary care from another VA besides the Indianapolis VA Medical Center and were excluded if they received primary care from a non-VA affiliated institution or the Indianapolis VA itself. A retrospective review was done utilizing electronic medical records. Data collected included: location of primary care, medications received from primary care, medications given upon discharge from the Indianapolis VA, documentation of a change in medication via review of discharge summaries and pharmacy and nursing education notes, incidence and outcomes of readmissions secondary to adverse drug events (ADE), incidence of emergency department and urgent care visits, and frequency of patient telephone contacts directly related to duplicate therapy.

Preliminary Results: Forty-four percent of patients receiving medications at discharge had significant drug interactions with the potential for serious adverse events. Fifty percent of patients had one or more therapeutic duplications at discharge. Thirty-three percent of patients were discharged with an exact medication, which they had in their possession at admittance. Average cost per patient for exact medication duplications was $79.25.

Preliminary Conclusions: Many therapeutic duplications and significant drug interactions are secondary to discharge medications. Significant costs are incurred secondary to the lack of monitoring for these potential duplications. Protocols need to be developed to prevent these occurrences.

Learning Objectives:

List three risks associated with discharging patients with either therapeutic or exact duplications of medication.

State three roles the pharmacist can play in the discharge of a patients from the hospital with regards to therapy changes.

Self Assessment Questions:

There is risk associated with physicians not documenting pharmacological changes in therapy in a discharge summary.
a. True
b. False

Exact medication duplications place minimal financial and resource burden upon an institution.
a. True
b. False

AN OUNCE OF PREVENTION: REINSTATING HEALTH RISK ASSESSMENTS IN AN OUTPATIENT URGENT CARE SETTING

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Purpose: The identification and treatment of the early stages of chronic disease (e.g. pre-hypertension, impaired glucose tolerance), or of undiagnosed disease, has the potential to improve quality of life, save healthcare costs, and reduce morbidity and mortality. The Health Risk Assessment (HRA) is a tool that can be used to identify patients in need of intervention. Historically, it has been administered in our outpatient urgent care clinic as a part of the routine care patients receive. In the past year, the number of HRAs completed has declined due to staff reorganization. The primary objective of this study is to increase the HRA completion rate by implementing a pharmacist-designed workflow pattern.

Methods: Barriers to the administration of HRAs as a routine clinic service were characterized at a pharmacist-led clinic staff meeting. The information gathered was synthesized into an initial workflow design. Training on the administration of HRAs was provided to all involved staff members before reinstatement of the service. Supply needs were estimated based on past use. Success of the initial workflow design and staff satisfaction will be evaluated by surveying the clinic staff monthly for the first three months after reinstatement of the service and improvements will be made based on staff feedback.

Results: The results will be descriptive in nature and will assess the primary outcome of HRA completion rate for the study period compared to one year prior. Secondary outcomes evaluating time spent performing HRAs, number of abnormal laboratory values and health risks identified, and the proportion of patients needing and receiving referrals to a primary care physician (PCP) will be assessed.

Conclusions: We anticipate that a redesigned workflow will increase the number of HRAs completed in our outpatient urgent care clinic resulting in an increased number of risks identified and referrals to a PCP.

Learning Objectives:

Describe how a pharmacist can develop and implement a workflow for increasing HRA completion rates in an outpatient urgent care setting.

Identify the impact of a pharmacist on redesigning a workflow pattern in an outpatient urgent care setting and the effect this had on the number of HRAs completed.

Self Assessment Questions:

Workflow development is a process that occurs once and does not require updating or improvement. T or F

The number of HRAs completed increased following implementation of the redesigned workflow. T or F

EVALUATION OF MEDICATION SAFETY INTERVENTIONS DOCUMENTED BY PHARMACISTS IN AMBULATORY CARE

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Purpose: A number of patients are injured each year by medication errors and drug-related problems (DRPs). Medication safety is a major concern in primary care since prescribing medications is the most common intervention performed. Pharmacists are able to improve safety by identifying and resolving DRPs. The primary objective of this study is to describe the type of medication safety interventions performed by pharmacists in an urban ambulatory care clinic. The secondary objectives are to determine predictors of specific DRPs and to describe the physician acceptance rates of the pharmacists' recommendations.
Methods: This is a prospective study documenting the interventions performed by the pharmacists at the Mercy Family Health Center in Chicago, Illinois. A PDA documentation system was specifically developed for this clinic utilizing Pendragon Forms, version 4.0. All interventions that are performed will be documented with patient demographics, recommendations, and physician acceptance. Descriptive statistics will be employed to describe the types and frequencies of interventions and physician acceptance rates. A logistics regression analysis will be used to determine whether any patient predictors are significant for pre-selected DRPs.
Results: To date, 388 interventions have been documented. The mean patient age is 60.4 years, the mean number of prescriptions is 6 per patient, and 75.1% of patients are female. The most common interventions include lab monitoring (53.4%) and patient education (13.9%). In addition, the most common intervention medications documented are anticoagulants (53.6%) and cardiac medications, including diuretics (9.3%). Data is still being collected and will be formally evaluated once collection is complete.
Conclusion: The clinical pharmacy services in this clinic are relatively new and the results from this study will document the pharmacists' impact on medication safety. The results will also provide information regarding specific patient characteristics that may increase a patient's risk for certain DRPs.

Learning Objectives:

To review the benefits of clinical pharmacy services that have been previously documented in the literature.

To identify specific patient characteristics that have been associated with an increase in drug-related problems in previous studies.

Self Assessment Questions:

Which of the following are documented benefits provided by clinical pharmacy services?
a. Improve blood pressure control
b. Reduce the number of drug-related problems present
c. Reduce patient's cholesterol
d. All of the above are correct

Which of the following are documented predictors of increased drug related problems?
a. Taking multiple medications
b. Having multiple co-morbidities
c. Being less than 65 years of age
d. A and B are correct
e. All of the above are correct

EVALUATION OF THE CEREBRAL HEMODYNAMIC EFFECTS OF REMIFENTANIL IN PATIENTS AT RISK FOR INCREASED INTRACRANIAL PRESSURE

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Background: Patients with traumatic brain injury (TBI), subarachnoid hemorrhage (SAH) and intracranial hemorrhage (ICH) are at increased risk for developing increased intracranial pressure (ICP). The elevation of ICP can compromise cerebral perfusion pressure (CPP) and ultimately can lead to poorer neurologic outcomes, which increases morbidity/mortality in patients with brain injury. Sedative/analgesic agents such as fentanyl and propofol have been evaluated for their ability to decrease ICP. Currently, there is no published data on the cerebral hemodynamic effects of remifentanil, a fetanyl derivative, outside of the operating room setting. It is hypothesized that remifentanil will reduce or have a neutral effect on ICP.

Objectives: Evaluate the cerebral effects, efficacy, and safety of 2 dose regimens of remifentanil infusion (0.1mcg/kg/min or 0.15mcg/kg/min) in mechanical ventilated patients during endotracheal suction.

Methods: This is a single center, prospective, randomized, placebo-controlled, crossover study. Adult patients between the ages of 16 to 79 years of age are enrolled if they have sustained a TBI, SAH or ICH. Additional criteria include the need for mechanical ventilation, ICP monitoring device, arterial catheter, ICU stay, enrollment within 96 hours of ictus and written informed consent. Exclusion criteria include: coronary heart disease, uncontrolled hypertension (MAP >140) or ICP (>25mm Hg for >30 minutes), nonreactive pupils, eminent neurologic death, or receipt of sedative/opioids within 4 hours. It is estimated that 10 patients are needed to detect a change of 5mm Hg of ICP to achieve a power of 80% and a $p<0.05$. Demographic data will be collected and outcome measures include ICP, CPP, MAP and middle cerebral artery blood flow velocity.

Results/Conclusions: To be presented

Learning Objectives:

Discuss treatment and management strategies of increased intracranial pressures secondary to a traumatic brain injury, subarachnoid hemorrhage, or intrancranial hemorrhage.

Review the theoretical advantages of reducing intracranial pressure in this population of patients.

Self Assessment Questions:

Propofol or opioids are not used for the management of increased intracranial pressure in patients with subarachnoid hemorrhage or traumatic brain injury.
True/False

Cerebral perfusion pressure is independent of mean arterial pressure.
True/False

EVALUATION OF THERAPEUTIC OUTCOMES IN PATIENTS ON HEPARIN BEFORE AND AFTER ADDITION OF AN ACUTE CORONARY SYNDROME HEPARIN PROTOCOL

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Weight-based heparin protocols compared to physician-guided dosing have demonstrated benefits without an increase in clinically significant bleeding. These include lower recurrence rates of deep vein thrombosis (DVT), quicker achievement of therapeutic activated plasma thromboplastin time (aPTT), and fewer heparin dosage adjustments. At the Zablocki VA Medical Center, two heparin protocols were available for use until November 2004: traditional dosing for DVT/pulmonary embolism (PE) and a no-bolus vascular surgery protocol. Therapeutic aPTT of each protocol is correlated to an anti-factor Xa level of 0.3-0.7 units/mL. For patients with acute coronary syndrome (ACS), recent evidence suggests benefits from a narrower therapeutic range, i.e. aPTT levels correlated to anti-factor Xa levels of 0.14-0.34 units/mL. To reflect changes in guidelines, in November 2004, the Medical Center incorporated an ACS protocol.

Purpose: The primary objective of this study is to determine if there is a difference in the safety and efficacy of heparin use before and after the addition of the ACS heparin protocol. Safety will be determined by the incidence of major and minor bleeding at supratherapeutic aPTT levels. Efficacy is determined by whether or not patients achieve therapeutic aPTT by 24 hours. A secondary endpoint is to determine the rate of utilization of weight-based heparin protocols pre and post ACS protocol implementation.

Methodology: This is a retrospective chart review, approved by the Institutional Review Board (IRB). Data will be collected on all patients on heparin for at least 24 hours over a three-month period pre and post addition of the ACS protocol. The mean time and mean number of lab draws to achieve therapeutic aPTT will be calculated. Data will be evaluated to determine if the appropriate heparin protocol was utilized per indication, if patients achieved therapeutic aPTT at 24 hours, and if supratherapeutic levels were associated with bleeding complications.

Results: In progress

Learning Objectives:

Discuss the rationale behind using aPTT levels correlated to antifactor Xa levels to assess effectiveness of unfractionated heparin.

Identify appropriate indications for the low intensity weight-based heparin protocol.

Self Assessment Questions:

True or false: Weight-based dosing and monitoring of heparin helps achieve therapeutic aPTT faster than traditional methods.

Identify which protocol should be used for patients with atrial fibrillation:
A. High Intensity (DVT/PE protocol)
B. Low Intensity (ACS Protocol)

EVALUATION OF LOW-DOSE ONDANSETRON IN THE PROPHYLAXIS AND TREATMENT OF POSTOPERATIVE NAUSEA AND VOMITING

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Purpose: The purpose of this study is to evaluate an antiemetic protocol for prophylaxis and treatment of postoperative nausea and vomiting (PONV) implemented by the department of pharmacy in 2004.
Methodology: A retrospective chart review was performed on 116 postoperative patients entering the recovery rooms of a 711-bed academic-community hospital over a 48-hour period to determine prophylactic and abortive antiemetic therapies employed. Each patient was evaluated for risk factors of PONV and categorized as having 0, 1-2, 3-4, or 5 risk factors. Dose and time of administration of dexamethasone and ondansetron in relation to surgery were evaluated. Incidence of PONV was noted despite prophylaxis. Compliance with institutional guidelines was evaluated.
Results: As risk factors for nausea and vomiting increase from 1-2 (n=22), 3-4 (n=78), and 5 (n=15), the rate of prophylaxis also increased from 50%, 56%, to 60%, respectively. Prophylaxis for PONV according to risk factor stratification was not consistent throughout the designated risk factor groups. Ondansetron was given appropriately at the end of surgery in 33% of patients, whereas dexamethasone was given appropriately preoperatively or at the beginning of surgery in 45% of patients. Prophylactic administration of ondansetron 4mg occurred in 95% of patients. Ondansetron 4mg was used for the treatment of PONV in 56% of patients.
Conclusions: Despite antiemetic guidelines implemented by the department of pharmacy and published by the International Anesthesia Research Society detailing the multi-modal management of postoperative nausea and vomiting, many patients with multiple risk factors for PONV did not receive multi-modal prophylaxis. Educational and operational strategies will be implemented to encourage use of 2mg ondansetron for routine prophylaxis and treatment of PONV. Upon completion of interventional strategies, a second retrospective chart review will be performed to measure the impact made on the utilization and efficacy of antiemetic therapy.

Learning Objectives:

Identify risk factors for the development of postoperative nausea and vomiting.

Determine when multi-modal prophylaxis and treatment of postoperative nausea and vomiting is indicated.

Self Assessment Questions:

True or False The purpose of risk-factor stratification is to cost-effectively prophylax high-risk individuals.

What is the dose-response curve for ondansetron?

A RETROSPECTIVE EVALUATION OF LINEZOLID INDICATIONS AND MONITORING PRACTICES IN PATIENTS WITH CYSTIC FIBROSIS

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Purpose:
Patients with Cystic Fibrosis (CF) are often colonized with resistant strains of microorganisms, including Oxacillin Resistant Staphylococcus aureus (ORSA). Until recently, the therapeutic options for treating ORSA respiratory infections in patients with CF have been intravenous (IV) vancomycin or chloramphenicol (IV or G-Tube). Since the introduction of linezolid to the market, its use in treating resistant gram positive infections in patients with CF at Cincinnati Children's Hospital Medical Center (CCHMC) has increased in both the inpatient and outpatient settings.

Linezolid is an alternative for gram positive pulmonary infections in patients unable to tolerate vancomycin. It is often prescribed in the outpatient setting due to the good oral bioavailability. Less common, but severe, adverse reactions from linezolid include anemia, neutropenia, thrombocytopenia and serotonin syndrome. Concomitant administration of linezolid with an SSRI can increase the risk of serotonin syndrome. This retrospective chart review evaluated the indications for linezolid as well as monitoring practices for linezolid use in the CF population at CCHMC.

Methods:
A retrospective chart review examined 30 inpatient and 30 outpatient antibiotic courses in CF patients receiving linezolid. Data collection included dose, concomitant medications, indications for linezolid, renal function and CBC. Charts were reviewed to determine if monitoring for bone marrow suppression and serotonin syndrome is appropriate.

Results:
Of the 9 individual inpatients reviewed (30 antibiotic courses), four were prescribed linezolid because of a vancomycin allergy and renal insufficency, three had renal insufficiency but no vancomycin allergy and two had no apparent indication for linezolid over vancomycin. Throughout the duration of the inpatient linezolid therapy, 53% of the antibiotic courses were monitored by a weekly CBC, whereas, 80% of the courses were monitored with a CBC 10 days apart. Data collection continues and results of the outpatient chart review will follow.

Learning Objectives:

List adverse reactions associated with linezolid.

Understand the importance of monitoring weekly CBC while patients are receiving linezolid as well as the importance for monitoring for signs and symptoms of serotonin syndrome in patients receiving both linezolid and SSRIs.

Self Assessment Questions:

T or F Signs and symptoms of serotonin syndrome include hypertension, tachycardia, tremors, agitation, fever and elevated lactic acid.

T or F Linezolid is not a good drug choice for the treatment of pulmonary infections because of its poor lung penetration.

A RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED STUDY TO EVALUATE THE EFFICACY OF A SHORT COURSE OF LOW DOSE CORTICOSTEROIDS FOR POSTTRAUMATIC STRESS DISORDER (PTSD) SYMPTOM EXACERBATIONS

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BACKGROUND:
Initial investigators of the role of the hypothalamic-pituitary-adrenal (HPA) axis in posttraumatic stress disorder reported low cortisol levels, increased glucocorticoid receptor density, and increased negative feedback sensitivity of the HPA axis. While there are uncertainties about the endocrinologic abnormalities in PTSD, numerous studies have shown that the HPA axis is affected. To date, there have been no direct trials of short term steroid use in PTSD. The goal of this study is to evaluate the efficacy of low dose prednisone therapy in the treatment of acute PTSD symptom exacerbations.

METHODS:
This study is a 14-day, prospective, randomized, double-blind, placebo-controlled clinical trial of prednisone for the treatment of PTSD symptom exacerbation. Patients identified by their primary mental health care provider as experiencing an acute exacerbation of PTSD symptoms are being invited to enroll in the study. Patients are subsequently randomized to receive either 20 mg of prednisone once daily or matching placebo for 14 days. At the initial screening visit the Clinician Administered PTSD Scale (CAPS), 17-item Hamilton Depression Scale (HAM-D), Clinical Global Impressions Severity Scale (CGI-S), Treatment Outcome PTSD Scale (TOP-8) and the PCL-PTSD is administered. A baseline DHEA-S and Chem 7 is drawn, as well as a urine pregnancy test for females, at the initial visit. Salivary cortisol is measured at midnight prior to the first dose of study medication. Patients are contacted by telephone on Day 7 to assess for adverse effects or worsening PTSD symptoms. On Day 14, the clinical symptom scores are readministered and DHEA-S and Chem 7 measured. The patients return at weeks 6 and 12 (study end) for the final clinical symptom score assessments and laboratory measurement of Chem-7, DHEA-S and salivary cortisol.

RESULTS/CONCLUSIONS:
Study enrollment and initial data collection is ongoing. Preliminary results and conclusions will be presented.

Learning Objectives:

Discuss the theories implicating the role of the HPA axis in PTSD.

Describe the safety and efficacy of short-term prednisone therapy in the treatment of PTSD symptoms during an acute exacerbation.

Self Assessment Questions:

What are the clinical symptoms of PTSD?

Which of the following reasons explains the rationale behind using a 14-day course of 20 mg of prednisone daily for PTSD symptom exacerbations?
a. A systemic anti-inflammatory response was desired.
b. Lower doses have the potential to cause greater side effects including depression, mania, and psychosis.
c. The dose used was comparable to doses of dexamethasone used to evaluate the HPA axis.
d. None of the above.
e. All of the above

COMPLIANCE WITH PERIOPERATIVE PROPHYLAXIS GUIDELINES AT EVANSTON NORTHWESTERN HEALTHCARE

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Surgical Site Infections remain a substantial cause of morbidity and mortality among hospitalized patients. Guidelines for antimicrobial prophylaxis have been developed by the Hospital Infection Control Practices Advisory Committee to reduce surgical site infections. At Evanston Northwestern Healthcare (ENH), similar guidelines have been in place for several years to assist health care providers on selection, timing, and duration of antimicrobial therapy for various surgical indications. Despite the availability of these guidelines, studies assessing the current practice of surgical prophylaxis have shown an overuse of antimicrobials, inappropriate selection and timing of antimicrobials. The objective of this study is to evaluate the level of compliance with ENH perioperative prophylaxis guidelines by examining the selection, timing, and duration of therapy.

A retrospective, chart review will be performed to evaluate the adherence to the guidelines for appropriate timing of pre-op antimicrobial prophylaxis (within 60 minutes prior to incision), appropriate duration of post-operative prophylactic antimicrobial therapy (<24 hours after surgery, may use up to <72 hours for heart valve replacement), and appropriate selection of prophylactic antimicrobial therapy. Five major surgeries will be evaluated (Neurosurgery, Orthopedic surgery, Cardiovascular surgery, Hysterectomy and Bowel surgery). A sample of 422 for each type of surgery will be sufficient to obtain a 95% confidence interval of total width 10% (5% on each side) for each proportion. This is calculated with the assumption that the proportion will be around 50%, which gives the largest necessary sample size (384), and assumes a necessary sample inflation of 10% to account for lost or missing data.

Learning Objectives:

To determine the level of compliance of ENH perioperative prophylaxis guidelines by examining the selection, timing, and duration of therapy.

To assess if the level of compliance/or incompliance with the guidelines correlate to the rate of surgical site infections.

Self Assessment Questions:

Surgical site infections are the second most common cause of nosocomial infections? T/F

Prolonged used of prophylactic antimicrobials is associated with emergence of resistance? T/F

COMPARISON OF THE USE OF PIPERACILLIN/TAZOBACTAM VS. CEFEPIME FOR THE TREATMENT OF FEBRILE NEUTROPENIA

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Background: Neutropenic fever is a dangerous result of hematological malignancies or the chemotherapy used to treat such malignancies. Approximately 48-60% of neutropenic patients will become febrile when they have an infection. This is of great concern since the body cannot mount an appropriate response to the infection in its weakened immune state. It is therefore important that patients with febrile neutropenia receive empiric antimicrobial therapy.

Prior to January 2003, the University of Michigan Hospitals and Health Centers had no set guidelines for the treatment of neutropenic fever, although a common antibiotic regimen included the use of cefepime. In January 2003 new guidelines were implemented in the institution with piperacillin/tazobactam as the workhorse for empiric treatment of neutropenic fever.

Objectives: The primary objective of this study is to evaluate prescriber compliance to the guidelines. Secondary outcomes include changes in antimicrobial regimen, occurrence of breakthrough infection, changes in susceptibility patterns, safety of the antibiotic, and cost.

Methods: This is a retrospective chart review of patients with neutropenic fever that received care at this institution. Data will be collected from 100 patients treated prior to December 2002, and data will be gathered from another 100 patients treated after the guidelines were implemented in January 2003. Subjects were identified through a search of the pharmacy database. Patients were excluded from the study if they were under 18 years old or they were not treated on the hematology service. For patients treated before guideline implementation, treatment must include the use of cefepime in the antimicrobial regimen.

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

Learning Objectives:

Describe the current clinical guidelines for empiric treatment of neutropenic fever.

Compare the clinical efficacy of cefepime to piperacillin/tazobactam for empiric treatment of neutropenic fever.

Self Assessment Questions:

Which of the following antibiotics are not recommended by the Infectious Disease Society of America as monotherapy for treatment of neutropenic fever?
a. cefepime
b. ceftazidime
c. piperacillin/tazobactam
d. meropenem

Vancomycin therapy should be initiated in all neutropenic patients that spike a fever.
a. True
b. False

IMPLEMENTATION OF A PHARMACIST-PROVIDED TOBACCO CESSATION PROGRAM IN A COMMUNITY PHARMACY

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Seventy percent of current smokers want to quit every year, yet only five to seven percent succeed. A lack of widely available resources may be a contributing factor to the large discrepancy between the number of smokers who want to quit and those who are actually successful. The purpose of this project is to develop a tobacco cessation program in a community pharmacy for patients that require guidance to quit. The project will also aim to compare quit rates of a pharmacist-provided tobacco cessation program to those found in the literature. Prior to program development, patients and pharmacy staff at a hospital outpatient pharmacy were surveyed in order to gauge an appropriate charge for the program as well as employee preferences for implementation. Primary methods include creating a program outline and guide, establishing a collaborative practice agreement with a physician, and creating marketing tools to recruit patients. The tobacco cessation program involves both pharmacotherapy and behavioral counseling services based on the Public Health Service Clinical Practice Guideline. Participants of the program are required to be greater than 18 years of age. The program consists of at least nine sessions over an eight-week period in a one-on-one format between a pharmacist and the patient. Primary data collected will include quit rates based on self-reports of cessation at two, three, six, and twelve months after the patient's quit date. Data collection is ongoing. Results of 16 patient surveys indicate that 44% of patients are not willing to pay for a tobacco cessation program, 44% are willing to pay $50 to $100, 6% are willing to pay $100 to $150, and 6% will pay a different amount. Based upon the patient survey results, the service is marketed to patients in the community at a cost of $100. Patient recruitment began in January 2005.

Learning Objectives:

Recognize the prevalence of tobacco use in the United States.

Understand the processes involved in implementing a tobacco cessation program into a pharmacy setting.

Self Assessment Questions:

What is the estimated percentage of adults that were smokers in the United States in 2002?
a. 22.5%
b. 85%
c. 5%
d. 12%

True/False A collaborative practice agreement is necessary for implementing a tobacco cessation program into a community pharmacy.

DEVELOPMENT AND IMPLEMENTATION OF PRIOR AUTHORIZATION PROCESS IN A UNIVERSITY HOSPITAL-BASED AMBULATORY INFUSION CENTER

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Introduction: Each year over $1 billion is spent nationally on infliximab. This and other high cost drug are often administered without much clinical oversight from a pharmacist. In an effort to control use of high cost drugs, a prior authorization process is often used. The use of prior authorization criteria include clinical appropriateness and parameters for monitoring, thereby ensuring proper use of a drug.

Objective: The objective of this project is to develop a prior authorization process for high cost medications used in an ambulatory infusion center. Infliximab will be used as the pilot drug.

Methods: A University HealthSystem Consortium (UHC) survey was created to assess processes pertaining to high cost injectable medications. Published literature pertaining to infliximab was reviewed for appropriate indications, dosing, and monitoring parameters. The prior authorization process and specific criteria for infliximab were reviewed and approved by P&T committee. The prior authorization criteria and process will be piloted in the ambulatory infusion center. Adjustments based upon feedback surveys, will be made as needed to the prior authorization form and process. After the pilot of infliximab, the prior authorization system will be modified to fit other injectable drugs used in the infusion center. Targeted drugs will be those with a cost greater than $5000 annually. This policy and procedure will eventually be implemented in all clinics affiliated with the health-system.

Preliminary Results: Seventeen of the 90 UHC hospitals responded. Fifteen respondents operate an infusion center. Nine respondents have mechanisms in place to determine clinical appropriateness for high cost injectable medications. The guidelines for infliximab are currently being implemented.

Learning Objectives:

Describe how a prior authorization process can be used to control the rising cost of injectable medications.

List the step involved with implementing a prior authorization process.

Self Assessment Questions:

Name one way to attempt to control the rising cost of infliximab.

Prior authorization is one way to control the rising cost of injectable medications. True or False

EVALUATION OF A PERI-PROCEDURAL EDUCATION PROGRAM FOR PATIENTS UNDERGOING WARFARIN INTERRUPTION

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Occasionally, patients taking warfarin must undergo an invasive medical procedure (e.g. colonoscopy, endoscopy, biopsy) that requires discontinuation of their warfarin therapy. Patients at high risk for thromboembolism during warfarin interruption are often treated with peri-procedural low molecular weight heparin (LMWH) through a process called “bridging”. The use of enoxaparin for peri-procedural anticoagulation is the standard of care at the Madison VAMC. Patient education regarding warfarin interruption and self-injection of enoxaparin has been an important component of the Madison VAMC's outpatient peri-procedural protocol. This is a 24-month prospective observational study designed to evaluate patient's knowledge, self-injection skills, and attitudes regarding the bridging process in an outpatient anticoagulation clinic VA setting.

Warfarin interruption materials were revised prior to initiation of the study. The restructured peri-procedural program now includes an educational booklet for the patient, a patient-specific enoxaparin/warfarin dosing schedule, and a pretested 11-item knowledge questionnaire covering the main objectives of the educational session.

Enrolled patients meeting the inclusion criteria were provided one-on-one teaching concerning the bridging process and use of low molecular weight heparin for anticoagulation. The patients were given an educational booklet and dosing schedule. They were also instructed on self-injection with a demonstration by the Anticoagulation Clinic provider and a return demonstration by the patient or caregiver. At the conclusion of the session, an 11-item knowledge questionnaire was completed by the patient and reviewed with the provider. Post-procedure questionnaires were completed at the time of enoxaparin discontinuation to assess attitudes and overall satisfaction regarding the bridging process. Data collection is nearing completion and preliminary results will be presented.

Learning Objectives:

Describe the components of a peri-procedural bridging education program.

Describe the attitudes of patients receiving peri-procedural bridging.

Self Assessment Questions:

True or False: At the Madison VAMC, most patients undergoing warfarin interruption feel the benefits of using enoxaparin outweigh the discomfort.

True or False: Most study patients perceived the bridging process as complicated.

EVALUATION OF STRESS ULCER PROPHYLAXIS PRACTICES IN A PEDIATRIC INTENSIVE CARE UNIT

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Purpose:
Patients admitted to an intensive care unit (ICU) are at an increased risk of developing upper gastrointestinal bleeding secondary to stress ulceration. In adults, the incidence of clinically significant upper gastrointestinal bleeding is reported as <2%. Although upper gastrointestinal bleeding is reported to be a significant occurrence in adult intensive care units and a cause of significant morbidity and mortality, little is known about the importance of this problem in the pediatric population. One study involving pediatric ICU patients reports three independent risk factors for clinically significant upper gastrointestinal bleeding, including respiratory failure, coagulopathy, and PRISM score ≥10. While stress ulcer prophylaxis guidelines have been published for adult ICU patients, there are a limited number of studies available which evaluate stress ulcer prophylaxis practices in pediatric ICU patients.

The purpose of this study was to evaluate the safety and efficacy of stress ulcer prophylaxis practices in the pediatric intensive care unit (PICU) at Cincinnati Children's Hospital Medical Center (CCHMC).

Methods:
Data was collected prospectively on all patients 0-18 years of age admitted to the PICU between October 2004 and January 2005. The data collected during the patient's PICU admission included stress ulcer prophylaxis agent selected, concurrent medications, nutrition status, mechanical ventilator status, evidence of GI bleeds, and adverse reactions related to stress ulcer prophylaxis medications. Data collected also included the total number of days in the PICU and PRISM score on admission into the PICU.

Results:
To date, 400 patients have been evaluated. Data analysis is currently underway.

Learning Objectives:

To identify those patients that are at an increased risk of developing clinically significant gastrointestinal bleeding while in a pediatric intensive care unit.

To understand the role of stress ulcer prophylaxis agents in treating critically ill pediatric patients.

Self Assessment Questions:

All patients admitted to a pediatric intensive care unit should receive stress ulcer prophylaxis. T F

Pediatric patients are more likely than adults to develop clinically significant gastrointestinal bleeding while in an ICU. T F

TOLERABILITY OF SPIRONOLACTONE IN VA HEART FAILURE PATIENTS

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Purpose:
The Randomized Aldactone Evaluation Study (RALES) published in 1999 demonstrated that spironolactone, when used in conjunction with an ACE inhibitor in patients with New York Heart Association (NYHA) functional class IV, reduced the risk of death and hospitalizations due to heart failure. RALES also demonstrated that spironolactone improved the symptoms of heart failure, as measured by changes in NYHA functional class without serious adverse effects such as hyperkalemia. However, treatment with spironolactone in patients with heart failure has recently been implicated in causing hyperkalemia resulting in increased hospitalizations and death.

The purpose of this study is to evaluate the tolerability of spironolactone in VA heart failure patients. Tolerability will be determined by evaluating potassium levels, serum creatinine levels, and adverse events associated with spironolactone treatment. In addition, this study will evaluate the rates of hospitalizations or death due to heart failure exacerbations and the rates of hospitalization or death due to elevated serum potassium levels.

Methods:
A list of patients diagnosed with heart failure and treated with spironolactone between January 1, 2003 and December 31, 2003 will be generated. A sample of approximately 200 patients will be randomly selected from the generated list for a retrospective chart review. The following information will be gathered for research purposes: doses of spironolactone used, baseline serum potassium and serum creatinine levels, follow up dates for serum potassium and serum creatinine levels, any adverse events, dates and reasons for hospitalizations, dates and reasons of death, patient demographics, NYHA functional class, ejection fraction, concomitant disease states, evidence of cardiac adverse events exhibited by changes on electrocardiogram, prescription records for sodium polystyrene sulfonate, and use and doses of concomitant medications.

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

Learning Objectives:

Clarify the audience's understanding of the role of aldosterone blockade in heart failure.

Determine the safety profile of spironolactone in the management of heart failure.

Self Assessment Questions:

True or False. Spironolactone does not have an FDA approved indication for the treatment of heart failure.

True or False. Careful monitoring of spironolactone in heart failure patients may help prevent hyperkalemia, adverse events, hospitalizations, and death.

ASTHMA CONTROL TEST (ACT): VALIDATION STUDY IN THE ELDERLY PROTOCOL

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Asthma is a chronic inflammatory disease of the lungs affecting nearly 15 million Americans and causing more than 5,000 deaths annually. Management of this disease has shifted from treatment of exacerbations to overall asthma control. “The fact that the level of asthma control is often overestimated by both patients and physicians indicated that asthma treatment guidelines alone are not enough to ensure the proper assessment of asthma control” (Nathan RA, et. al. “Development of the Asthma Control Test: A survey for assessing asthma control.” J Allergy Clin Immunol 2004; 113:59). Spirometry is often used to assess asthma control, but there is clearly a deficiency in other, easy to administer tools for asthma control. The Asthma Control Test (ACT) is a brief, easily administered, patient-based questionnaire designed to assess asthma control. It has been validated among children 12 years of age or older and adults.

Our research question is whether ACT's validity translates to an elderly population treated in a Veterans Hospital setting?

This is a cross-sectional, non-randomized, minimal risk study. Our study population will consist of asthma patients enrolled at the Allergy Clinic at the William S. Middleton VA Hospital. We plan to enroll 100 patients.

During a routine clinic visit, patients with asthma who meet stated criteria will be asked to consent to the study, fill out a HIPAA release of information, answer a demographic survey, and complete the 5 question ACT. Spirometry will then be preformed on each patient. The health care provider will document their current medications and complete the clinical assessment form after the visit. We plan to determine how well the ACT scores correlate with spirometry and the clinical assessment form.

Results and conclusions are pending.

Learning Objectives:

To determine the validity of ACT in an elderly population treated at a Veterans Hospital.

Identify a situation where ACT may be implemented in a clinic setting.

Self Assessment Questions:

Asthma control should only be measured using spirometry? True/False

Are you able to envision ACT being incorporated at your practice site to aid in asthma control? Explain.

CLINICAL AND ECONOMIC BENEFITS OF A NEW CEFEPIME DOSING STRATEGY

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Introduction: Cephalosporins are a class of antibiotic agents used extensively for many years throughout multiple populations. Cefepime is an extended-spectrum cephalosporin antibiotic that is active in vitro against a broad range of bacteria. Like other beta-lactam antibiotics, cefepime exhibits time-dependent bactericidal activity and lacks prolonged post-antibiotic effects against Enterobacteriaceae and Pseudomonas aeruginosa. In non-clinical models of infection against Enterobacteriaceae and Pseudomonas aeruginosa, antibacterial effects are maximized when levels exceed the minimum inhibitory concentration for 60-70% of the dosing interval. Based on this pharmacodynamic strategy, Sinai-Grace Hospital has opted to change the preferred dosing regimen of cefepime from 2 grams every 12 hours to 1 gram every 8 hours for patients with CrCl (creatinine clearance) of greater than 50 ml/minute in order to maximize time above the minimum inhibitory concentration. The purpose of this study is to compare the clinical and economic benefits of this new cefepime dosing strategy.

Methods: Patients were identified using a pharmacy database. Patients at Sinai-Grace Hospital who receive cefepime 1 gram every 8 hours or cefepime 2 grams every 12 hours between January 2004 and February 2005 will be randomized into the study. A retrospective chart review will include a cost analysis, as well as clinical outcomes, including patient demographics, vital signs, Apache II score, lab chemistries, co-morbid conditions, infection type, suspected site of infection, culture results, hospital length of stay, ICU length of stay, days of mechanical ventilation, days on vasopressors, other antibiotics before, during, and after cefepime, days on cefepime, cause of death (if applicable), adverse events and medications used to treat them, and clinical outcome. Patients will be excluded from the study if they are being treated for chemotherapy related febrile neutropenia or meningitis.

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

Learning Objectives:

Discuss the pharmacokinetic principles of cefepime.

Demonstrate how to use pharmacokinetic and pharmocodynamic principles to maximize efficacy in a cost efficient manner.

Self Assessment Questions:

True or False. Cefepime exhibits concentration-dependent killing.

True or False. Cefepime dosed 1 gram every 8 hours and 2 grams every 12 hours achieves the same pharmacodynamic goals for patients with CrCl > 50 ml/minute.

COMPARISON OF OUTCOMES FOR A PHARMACIST-RUN ANTICOAGULATION CLINIC VERSUS PHYSICIAN ANTICOAGULATION MONITORING

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Background and Purpose:
Warfarin sodium is the most commonly prescribed anticoagulant used in North America. Proper monitoring of warfarin therapy is necessary due to the increased risk of bleeding associated with this agent. Traditionally, patients have relied upon the prescribing physician to monitor anticoagulation. However, in recent years, anticoagulation clinics run by non-physician health care professionals have gained popularity. Health-care professionals typically involved in such clinics include nurses, advanced practice nurses, and pharmacists.

The University Hospital Anticoagulation Clinic is a pharmacist-run clinic. The clinic currently serves approximately 280 patients with a total of about 400 patient visits per month.

Methodology:
Patients who fill warfarin prescriptions at the University Hospital Outpatient Pharmacy between July 2003-June 2004 will be identified. The patients will be stratified based on whether their anticoagulation therapy is followed by the University Hospital Anticoagulation Clinic or their primary care physician. The patients identified will then be evaluated utilizing the Outpatient Pharmacy's SXC database, LASTWORD database, ACCESSANYWHERE database, and the Anticoagulation Clinic's Standing Stone database. Data collected will include anticoagulation indication, past medical history, concomitant medications, goal International Normalized Ratio (INR), number of INRs drawn, INR values, duration of therapy, dates of initiation and conclusion of therapy, vitamin K administration during study period, procedures undergone during study period, and adverse events requiring ED visit or hospitalization during the study period. The primary outcome is the incidence of hemorrhagic and thromboembolic events. Secondary outcomes will be time within therapeutic range and number of INRs drawn. This information will be compared between the two groups as well as to national standards to evaluate the outcomes for the pharmacist-run anticoagulation clinic.

Results/Conclusions:
Preliminary findings suggest similar outcomes between the two groups. Data collection is ongoing. Final results and conclusions are to be presented at Great Lakes Regional Conference.

Learning Objectives:

Discuss the models and options for outpatient anticoagulation management.

Describe the incidence of adverse events in anticoagulated patients being followed by a pharmacist-run anticoagulation clinic versus primary care physician.

Self Assessment Questions:

Traditionally, according to cited literature, anticoagulated patients being followed by a pharmacist-run anticoagulation clinic have better outcomes than those being followed by a primary care physician. True or False

Number of INRs drawn and time within therapeutic range are higher for patients being followed by a pharmacist-run anticoagulation clinic when compared to a primary care physician. True or False

CONVERSION FROM PRAVASTATIN TO FLUVASTATIN: A VA NATIONAL DRUG USE EVALUATION

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The purpose of this drug use evaluation (DUE) is to measure the effectiveness and safety of the pravastatin to fluvastatin conversion. The specific aims for measuring effectiveness are to evaluate the LDL-C lowering effects of the recommended dose conversion of pravastatin to fluvastatin, to determine if the dose of fluvastatin is adequately maximized (up to 80mg) to achieve optimal LDL-lowering effect, and to assess methods of conversion implementation employed by the Veterans Administration Medical Centers. The specific aims for measuring safety are to monitor for any adverse effects related to conversion (e.g., hepatotoxicity, myalgias, etc.) and to evaluate ALT following the conversion.
The DUE will be a prospective outpatient medical chart review. We plan to compare the most recent lipid profile, prior to switching from pravastatin to fluvastatin, to lipid levels 6-12 weeks after conversion. In addition, patients will be monitored for adverse effects related to the substitution.
Therapeutic interchanges are not expected to be successful in all patients due to inter-individual variability in responses even to drugs that exhibit a similar effect. Major risks to subjects would include adverse drug events experienced after the substitution, including hepatotoxicity, myalgias, and rhabdomyolysis, as well as inadequately controlled lipid profiles. Potential benefits to subjects include improved tolerability of the drug and/or improved lipid profiles. These findings may contribute to better patient care and improvement of VA-wide implementation of therapeutic interchanges.
The conversion from pravastatin to fluvastatin has been completed and results are pending.

Learning Objectives:

Identify equivalent dosing regimens of pravastatin and fluvastatin

List steps necessary for a therapeutic interchange

Self Assessment Questions:

What laboratory monitoring, and at what time interval, is necessary for lipid lowering medications?

What are the utilization patterns of HMG-CoA Reductase inhibitors at the Madison VA?

RE-EVALUATION OF A PHARMACY PRODUCTIVITY SYSTEM

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Objective:
Productivity is difficult to accurately measure in the pharmacy department. Typically, national benchmarking systems measure pharmacy productivity using patient days or admissions. The amount of work required by the pharmacy department depends not only on patient days, but on the types of medications being dispensed (i.e. chemotherapy, IVs, TPNs, oral meds, etc.) as well. The purpose of this project is to update the current productivity measurement system in the pharmacy department.

Methodology:
Our current productivity system uses relative value units (RVUs) to measure productivity related to distributive processes and clinical activities. The update will be accomplished by measuring the current productivity system for a two-week period and gathering input from pharmacists and technicians who work in various patient care areas of the hospital regarding the amount of work for each of the data elements. The new RVUs will then be implemented and productivity will be measured at the same hospital for an additional two-weeks. The results of the two measurement systems will subsequently be compared to determine if the proposed system will adequately reflect productivity. The re-evaluated RVU data will then be taken and measured in other hospitals within our health system. After measuring the data, the RVUs will be refined to accurately reflect productivity across the Aurora Heath Care System. The updated RVUs will then be implemented in each hospital.

Results:
Data is being collected.

Conclusions:
It is anticipated that this project will enable all the hospitals in the Aurora system to track pharmacy productivity in the same way.

Learning Objectives:

Recognize the complexity of measuring productivity within a pharmacy department.

Understand various ways of determining pharmacy productivity.

Self Assessment Questions:

True or False: There is a standard way of measuring productivity for a pharmacy department.

True or False: Using patient days/ patient admissions is an accurate way in which to measure pharmacy workload and productivity.

PHARMACOKINETIC, PHARMACODYNAMIC, AND PHYSIOLOGIC EFFECTS OF ST. JOHN'S WORT (HYPERICUM PERFORATUM) ON WOMEN RECEIVING ESTROGEN-CONTAINING ORAL CONTRACEPTIVE AGENTS

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St. John's Wort (SJW), a popular herbal product used for mild to moderate depression, is a known inducer of cytochrome P450 (CYP) 3A4 enzyme and P-glycoprotein (P-gp). Since estrogen is a CYP3A4 substrate, it has been suggested that SJW may decrease the efficacy of estrogen-containing oral contraceptives (OC). However, limited data are available evaluating the magnitude and significance of this potential drug interaction.

The objective of the study is to compare the pharmacokinetic (PK), pharmacodynamic (PD), and physiologic effects of OC with and without the concurrent use of SJW.

This is a prospective, single-blind, crossover study. Twenty healthy, non-pregnant, pre-menopausal women between 18-45 years of age are being recruited to participate. Subjects take a monophasic OC containing ethinyl estradiol 35 mcg and norgestimate 0.25 mg (OrthoCyclen®) daily for a total of 6 cycles. The first 2 cycles are the stabilizing period in which subjects are initiated on OC alone. If normal cycle control is achieved, they will take OC with placebo for the next 2 cycles, followed by SJW capsules for 2 more cycles. Two separate 24-hour visits to the University of Illinois Medical Center General Clinical Research Center involving a series of blood draw, an endovaginal ultrasound, and completion of a questionnaire are scheduled on day 21 of cycles 4 and 6. The PK parameters, related PD, and physiologic effects of ethinyl estradiol including luteinizing hormone, follicle-stimulating hormone, coagulation factors II and VII, and ovarian follicle size are compared between the placebo phase and SJW phase. Genomic techniques are applied to quantify the magnitude of induction of the following genes: CYP3A4, CYP3A5, and P-gp.

As of January 31, 2005, there are 16 active subjects enrolled and 1 subject has completed the study. Results will be presented at the Great Lakes Conference.

Learning Objectives:

To evaluate the pharmacokinetic, pharmacodynamic, and physiologic effects of SJW on women receiving estrogen-containing OC.

To investigate and quantify the mechanism of drug interaction between SJW and estrogen-containing OC.

Self Assessment Questions:

Concurrent use of SJW and estrogen-containing OC may affect the pharmacokinetic, pharmacodynamic, and physiologic effects of estrogen.

The mechanism of drug interaction between SJW and estrogen-containing OC involves the inhibition of CYP3A4 and P-gp.

DEVELOPMENT AND IMPLEMENTATION OF CLINICAL PHARMACY SERVICES FOR A HOSPICE ORGANIZATION

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Objective: The hospice pharmacist has a unique opportunity to contribute to multidisciplinary care teams that provide services and support to those who are terminally ill, however there is little documentation in the literature describing the actual implementation of these pharmacy services. An assessment of practice standards in the hospice setting is needed to identify clinical activities most likely to impact end-of-life care. The objective of this project is to evaluate current pharmacy practice standards in hospice settings and to implement a pharmacy program in a hospice that is affiliated with an integrated academic medical center.

Methods: A literature search was performed to gain information about the role of pharmacists in hospice centers, and a web-based survey was conducted to identify current standards of practice. Pharmacy services most likely to provide benefit to hospice patients were identified and incorporated into a plan for implementation.

Preliminary Results: The final results of the web-based survey will be reported at the conference. Medication use guidelines and a two-tier medication formulary were implemented in January 2005. A summary of cost savings and evaluation of medication use following formulary implementation will also be presented at the conference. A three-tier formulary system will be developed for future use as the hospice census grows. Policies and procedures for distribution of hospice inpatient medications and IV infusion medications are in the final stages of development. These policies and procedures will ensure the review of all hospice inpatient medications by an offsite pharmacist and will provide safe and efficient medication distribution that meets and exceeds current hospice regulatory standards.

Conclusions: Clinical pharmacy services have the potential to provide great benefit to hospice patients. This is verified by results of the literature search, survey, and preliminary results post-implementation of comprehensive pharmacy services.

Learning Objectives:

List examples of clinical pharmacy services that can be implemented in a hospice setting.

Describe the development and implementation of a three-tier medication formulary for hospice in-home patients.

Self Assessment Questions:

What are barriers to providing clinical pharmacy services to hospice patients?

Which pharmacy services were most valued according to the hospice care providers surveyed?

THE EFFECTIVENESS OF HYPERGLYCEMIC CONTROL IN TRAUMA PATIENTS AT METHODIST HOSPITAL TREATED WITH AN INSULIN REGIMEN.

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Recent research has shown that surigical intensive care unit (ICU) patients aggressively treated for hyperglycemia have better outcomes. Fueled by the release of catecholamines, glucagon, cortisol, and growth hormone, the body responds to stress by elevating blood glucose. As a result patients with uncontrolled blood glucose concentrations are more apt to develop infection, multiple organ dysfunction, neuropathy, dyslipidemia, and deranged coagulation and inflammatory responses. Maintaing euglycemia can be approached from multiple angles; short and intermediate acting insulin sliding scales, long acting insulin products, insulin drips and various combinations of short, intermediate and long acting insulin regimens. The objective of this study is to determine the effectiveness of current treatment practices in controlling serum glucose in the trauma population at Methodist hospital.

A retrospective, observational chart review of trauma patients in 2003 that were > 18 years old and admitted to the ICU for a minimum of 48 hours. Patients will be stratified into groups based on insulin regimen prescribed. Blood glucose values will be gathered based on bedside and daily blood glucose measurements found in the Clarian computerized record. Blood glucose values will be determined at baseline and throughout the first five days of ICU stay.

Preliminary data: In 2003, 754 patients > 18 years old were admitted to the trauma service at Methodist hospital, 418 met inclusion criteria and 135 received insulin. Of the 135 patients started on insulin, 84 were started on short acting insulin (regular insulin - sliding scale or insulin drip), 3 on long acting insulin preparations (glargine or ultralente), 22 on combination short and long acting preparations, and 23 on a variety of short, intermediate and long acting insulin regimens.

Learning Objectives:

Understand the role of tight glycemic control in the trauma patient.

Describe the various modalities for maintaining euglycemia.

Self Assessment Questions:

What is the benefit of maintaining tight glycemic control in critically ill patients?

T or F: A blood sugar of 250 mcg/ml is appropriate in a critically ill patient.

IMPROVEMENT OF ANTIMICROBIAL UTILIZATION IN PATIENTS WITH PULMONARY INFILTRATES AND A LOW RISK OF NOSOCOMIAL PNEUMONIA

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Hospitalized patients with pulmonary infiltrates generally receive empiric broad-spectrum therapy with multiple antimicrobials for presumed nosocomial pneumonia. However, infiltrates are often not caused by pneumonia, but rather by noninfectious processes. Consequently, patients receive prolonged courses of numerous antimicrobials without a diagnosis of infection. This indiscriminate use of antimicrobials contributes to increased costs and length of hospital stay, an increase in the emergence of antimicrobial resistance, and potentially an increase in mortality.

The purpose of the study is to improve antimicrobial utilization in hospitalized patients who develop pulmonary infiltrates and have a low risk of nosocomial pneumonia. Low risk is determined by a Clinical Pulmonary Infection Score (CPIS) less than or equal to six. Study goals include reduction in number of antimicrobial agents, duration of antimicrobial therapy, and emergence of antimicrobial resistance, while maintaining equivalent or improved treatment outcomes.

The study follows the DMAIC approach to process improvement. The problem is defined as indiscriminate use of antimicrobials (including number of agents and duration of therapy) in patients with low risk of nosocomial pneumonia. The measure phase evaluates current antimicrobial practices in this patient population (hospitalized patients developing pulmonary infiltrates) on all units, excluding hematology, oncology, transplant, and the intensive care units. Data analysis will include determination of the CPIS, the number of antimicrobial agents initiated for presumed nosocomial pneumonia, the duration of therapy, and the associated costs.

The study hypothesizes a significant degree of antimicrobial overutilization in patients with pulmonary infiltrates likely attributable to a noninfectious cause. The improvement policy will decrease overutilization while reducing emergence of antimicrobial resistance and decreasing costs. During the control phase, antimicrobial alerts will be implemented to identify targeted patients, which will ensure maintenance of the established improvements.

Learning Objectives:

Describe the potential risks associated with indiscriminate antimicrobial use.

Understand how the DMAIC process can be incorporated into clinical practice.

Self Assessment Questions:

Indiscriminate antimicrobial use can lead to emergence of antimicrobial resistance. (True/False)

List the steps corresponding to the DMAIC process.

A RETROSPECTIVE DESCRIPTIVE STUDY OF INSULIN TREATMENT STRATEGIES IN HOSPITALIZED, MEDICALLY ILL TYPE 2 DIABETICS

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Purpose: The American College of Endocrinology, American Association of Clinical Endocrinologists, and nine other supporting organizations recently released a position statement regarding glucose control in medically ill hospitalized patients. Recommendations from this statement include a goal pre-prandial blood glucose ≤ 110 mg/dL and a maximal blood glucose ≤ 180 mg/dL in non-critically ill patients, and advocates the use of intravenous or subcutaneous insulin to effectively control blood glucose. The recommendation also states that blood glucose control is best achieved when basal and prandial insulin is provided, while the use of sliding-scale insulin alone is discouraged. There are few studies assessing the safety and efficacy of sliding-scale insulin, however, available data do not support its use. This study is proposed to describe and compare glucose control associated with insulin treatment strategies in medically ill type 2 diabetics admitted to Akron General Medical Center for another condition.

Methods: A retrospective, intention-to-treat study will be performed to describe glucose control in previously diagnosed type 2 diabetic patients managed in the hospital with different insulin treatment strategies. The primary endpoint of the study is the percentage of capillary blood glucose measurements within acceptable (70 - 180 mg/dL) and optimal pre-prandial (70 - 110 mg/dL) ranges for specific testing times (before meals and at bedtime) and overall. Secondary endpoints include percentage of capillary blood glucose measurements within extreme excursion ranges (< 70 mg/dL or > 300 mg/dL), number of insulin dosage changes, number of insulin treatment strategy changes, number of doses of supplemental insulin given, length of hospital stay, and glycemic control associated with the type of sliding-scale insulin ordered.

Results/Conclusion: Data collection and analysis is currently ongoing. Results and conclusion will be presented at the conference.

Learning Objectives:

Understand and apply the ACE/AACE position statement regarding inpatient diabetes and metabolic control to your practice.

Describe and compare the clinical course of medically ill type 2 diabetic patients treated with different insulin treatment strategies while hospitalized for another condition.

Self Assessment Questions:

T or F The ACE/AACE position statement recommends a pre-prandial blood glucose ≤ 126 mg/dL in non-critically ill inpatients.

Which of the following insulin treatment strategies does the ACE/AACE position statement discourage the use of?
A) Intravenous insulin only
B) Sliding-scale insulin only
C) Scheduled insulin only
D) Scheduled insulin plus sliding-scale insulin

EFFECT OF NESIRITIDE VERSUS TRADITIONAL INTRAVENOUS THERAPY ON PATIENT OUTCOMES IN THE TREATMENT OF ACUTE DECOMPENSATED HEART FAILURE

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Background:
Acute decompensated heart failure (ADHF) is the primary or secondary diagnosis for over 3 million hospitalizations annually. Despite advances in treatment, patients admitted with ADHF have significant mortality and early readmission rates. Traditional intravenous (IV) therapy for ADHF includes agents such as nitroglycerin, nitroprusside, dobutamine, dopamine, milrinone, or inamrinone. These particular agents may unfortunately cause adverse effects that outweigh their therapeutic benefits. Nesiritide, a new agent recently approved for the treatment of ADHF, has been shown to have a more favorable adverse effect profile in comparison to traditional IV agents. Studies have also shown that nesiritide may reduce hospital readmissions for ADHF.

Purpose:
The goal of the study is to determine the utility of nesiritide as a treatment option for ADHF in place of or in addition to currently available options.

Methods:
A list of patients with inpatient orders for nesiritide or any of the traditional IV therapies stated above for the treatment of ADHF from August 1, 2003 through November 1, 2004 will be generated. The primary investigator will collect the following information from the patients' electronic charts: age, weight, gender, number of readmissions per patient and the amount of time between readmissions, length of hospitalization, number of ADHF-related deaths, whether adequate diuresis was provided in addition to treatment with nesiritide or traditional IV therapy, oral heart failure therapy prior to admission and upon discharge, time between presentation of the patient and administration of nesiritide or traditional IV agent, doses of nesiritide or traditional IV agent given, length of therapy, and any medication-related adverse events.

Results/Conclusion:
Data collection and analysis are ongoing. Results and conclusions are pending.

Learning Objectives:

Describe the role of natriuretic peptides and nesiritide in the treatment of ADHF.

Evaluate and discuss outcomes in heart failure patients treated with nesiritide or traditional IV agents for ADHF.

Self Assessment Questions:

Nesiritide can potentially cause the following adverse effect(s):
a) cardiac arrhythmia
b) hypotension
c) thiocyanate toxicity
d) all of the above

Nesiritide is a recombinant form of which endogenous natriuretic peptide?
a) ANP
b) BNP
c) CNP

THE EVALUATION OF N-ACETYLCYSTEINE USE IN A HEALTH SYSTEM.

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In 2003, acetaminophen (APAP) toxicity accounted for 127,171 exposures and 335 deaths reported by the American Association of Poison Control Centers. Currently, the standard of care for the treatment of suspected or documented APAP toxicity is N-acetylcysteine (NAC) via oral (PO) administration. Although NAC has only been available as a PO formulation in the US, until recently, the PO formulation has been administered intravenously (IV) for various reasons.

Literature has shown that NAC administered via the IV route has adverse drug reactions (ADRs) not experienced with the PO route. Many institutions prefer the IV route secondary to ADRs such as vomiting associated with the PO route. The Food and Drug Administration has recently approved an IV formulation of NAC (IV NAC) for use in suspected or documented APAP toxicity. Controversy exists as to which route will result in the safest, most effective and cost efficient route of administration.

Purpose: The objective of our study is to determine if either route of NAC administration has a significant effect on ADRs or length of stay (LOS) and to determine the role of IV NAC in our health system.

Methods: A retrospective chart review was performed of consecutive patients admitted to the emergency department at Detroit Receiving Hospital from 01/01/2000 to 12/31/2003 for suspected or documented APAP toxicity. Patients were identified by International Classification of Diseases, 9th revision (ICD-9) codes. Patients included were between 18 and 89 years of age and received at least one dose of NAC during their admission. The following data was collected: baseline demographics, confession of acetaminophen ingestion and/or co-ingestion, time since ingestion, size of ingestion, chronic versus acute ingestion, hepatic function tests, coagulation tests, acetaminophen levels, route of NAC administration, number of doses received, ADRs, charcoal use and LOS.

Results and Conclusion: Data and results to be presented.

Learning Objectives:

Explain the advantages and disadvantages of the available administration routes for NAC in suspected or documented APAP toxicity.

Identify situations when either route of administration of NAC is preferred in suspected or documented APAP toxicity.

Self Assessment Questions:

PO and IV administration of NAC appear to be equally effective when treating suspected or documented APAP toxicity. T or F

Adverse events from the use of PO NAC justify the use of IV NAC for all cases of suspected or documented APAP toxicity. T or F

CREATION OF A PRE- AND POST- TEST FOR ASSESSMENT OF DRUG INFORMATION SKILLS DURING AN ADVANCED CLERKSHIP ROTATION

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The purpose of this study is to objectively assess the information retrieval skills of pharmacy students on a drug information rotation. The Clarian Drug Information Center participates in the experiential training of over 40 pharmacy students a year in the area of drug information. Students are expected to provide drug information to other health care professionals in the form of memos, newsletters, conversations, and in-services. A required skill in this process is the ability to efficiently retrieve drug information. Due to the limited 1-month time that students are at the Clarian Drug Information Center, a standard, efficient way of detecting deficiencies at the start of the rotation would be helpful.

Methods: A pre-test will be given at the start of the rotation to get a baseline of the retrieval skills of the students. Based on this pre-test, the preceptors will be able to focus the experience on deficient areas. At the end of the rotation a post-test will be given that covers a representative number of pre-defined objectives of the rotation for comparison purposes. A retrospective pre/post survey will be given to the students to assess their feelings about this method of measurement. The names of students will need to be collected on the pre/post test until the end of the rotation to match the tests. At the end of the rotation the results of the tests will be put into a spreadsheet without any student specific information. At this time all paper copies of the tests with student names will be discarded.

The results and conclusions of this study will be presented.

Learning Objectives:

State potential advantages and disadvantages to using pre- and post- tests in experiential rotations

Identify areas within drug information where students report the most improvement through a drug information rotation

Self Assessment Questions:

What are 3 advantages and disadvantages of using pre- and post- tests for competency assessment?

What areas of drug information do students commonly report deficiencies?

ACTIVELY DEVELOPING REPORTING – THE IMPORTANCE OF REPORTING ADVERSE DRUG REACTIONS (ADRS)

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Currently, accrediting bodies require hospitals to have programs in place to report, review and take action on adverse drug reactions (ADRs). Due to a variety of factors involved in understanding and recognizing ADRs, including their unpredictability, many incidences go unreported.

The purpose of this project is to increase awareness of potential ADRs and to increase the rate of ADR reporting in a 300-active-bed, two-hospital system in Waukegan, Illinois.

Methodology: An evaluation of the current adverse drug reaction reporting practice was performed. This practice was compared to the data available in the current literature. Deficiencies of the current practice were then identified and assessed. Based on the identified deficiencies, multi-disciplinary teams were created to develop practice-specific reporting forms and then institute an educational program for each particular discipline. Staff in each patient care area was educated on their specific role and the importance of reporting ADRs. Education focused on the definition of an ADR and how to identify and report ADRs. In addition, the pharmacy worked closely with Health Information Systems (HIS) and Management Information Systems (MIS) to consolidate the identification of potential ADRs. The new program was implemented November 1, 2004 with the goal of increasing monthly reporting by 25%.

Results: Monthly adverse drug reaction reporting has increased at both hospitals, with one hospital showing a significant increase. The increase at both hospitals was due to improved reporting by the pharmacy. The new ADR program will be reassessed through a continuous quality improvement (CQI) process to better capture reporting in patient care areas and continue with the goal of increasing monthly ADR reporting. Results, including data that encompasses the CQI process, will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Define patient risk factors for adverse drug reactions.

Identify high-risk drugs likely to cause an adverse drug reaction.

Self Assessment Questions:

Which of the following are patient risk factors for an adverse drug reaction?

a. Age
b. Gender
c. Impaired renal function
d. History of a prior adverse drug reaction
e. All of the above

All of the following are considered high-risk drugs except:

a. aminoglycosides
b. digoxin
c. warfarin
d. levothyroxine
e. corticosteriods

OUTPATIENT SURVEY OF VETERANS' CHOLESTEROL KNOWLEDGE AND ATTITUDES TOWARD MEDICATION AND LIFESTYLE MODIFICATION

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Heart disease continues to be the leading cause of death in the United States, with hyperlipidemia being one of its modifiable risk factors. Medications are available to treat hyperlipidemia, however, patients play an important role, ultimately deciding whether or not to follow recommended treatment. Disease state knowledge, and attitude towards taking medication and making lifestyle modifications, influence how patients approach their treatment and may determine their adherence to medication and lifestyle recommendations. Limited reports of patients with hyperlipidemia and their attitudes toward medication and lifestyle modifications are available in the literature.

The purpose of this study is to determine if veterans taking cholesterol-lowering medication know more about hyperlipidemia or are more concerned about their cholesterol than patients not taking cholesterol-lowering medication. Attitudes regarding whether taking their medication relieves them from making recommended lifestyle modifications will be evaluated in the population of patients taking cholesterol-lowering medication. Medication adherence and risk factors will also be evaluated and compared between each group.

This study is a prospective, cross-sectional, single-center survey of outpatients enrolled in the Veterans Affairs Ann Arbor Healthcare System (VAAAHS). Patients in the VAAAHS ambulatory care clinics will be randomly approached and asked to participate in a survey evaluating cholesterol knowledge, medication adherence and attitude towards taking medication and making lifestyle modifications. Responses will be scored, evaluated and compared between patients taking cholesterol-lowering medication and those not taking cholesterol-lowering medication using a two sample T-test.

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

Learning Objectives:

Review available literature addressing patient compliance, knowledge and awareness of risk.

Evaluate patients' cholesterol knowledge, medication adherence and attitude towards taking medication and making lifestyle modifications.

Self Assessment Questions:

Hyperlipidemia is a major modifiable risk factor of heart disease and continues to be suboptimally controlled. T/F

Healthcare providers can potentially modify patient attitudes and knowledge. T/F

PHARMACIST ASSESSMENT OF OSTEOPOROSIS MANAGEMENT BY USUAL CARE

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Objective: Osteoporosis is a disease where most affected patients are asymptomatic. Over 10 million Americans suffer from this preventable disease that when detected early enough, is curable. In recent years, many patients have been taken off their hormone replacement therapy, leaving a potential treatment gap in at-risk patients. The primary objective of this study is to determine the incidence of patients at risk for osteoporosis who are not having this disease addressed by their primary care physician or other health care professionals. Other objectives include assessment of patient's awareness of lifestyle modifications, the proper use of calcium supplements, and whether gender influences knowledge of osteoporosis. This study will also examine whether osteoporosis is being monitored in women whose estrogen therapy has been discontinued.

Methodology: A preliminary survey was given to screen for patients at an increased risk for developing osteoporosis that were not having the issue addressed by a health care professional. A follow-up appointment was performed for those patients at risk not having the issue addressed. Questioning during this appointment assessed secondary objectives. Lifestyle modifications were discussed with patients in order to reduce the risk and progression of osteoporosis. Pharmacists monitored for appropriate doses and use of calcium and vitamin D and when appropriate, prescription medication were recommended to the physician to prevent the occurrence or progression of the disease. Patients were excluded from the study if they have a life expectancy of less than one year, a psychiatric illness that would prevent them from participating in the study, or a diagnosis of osteoporosis. Data from this clinic was collected by clinical pharmacists conducting the osteoporosis appointment and analyzed using descriptive statistics. Results will be presented at Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Review of modifiable aspects to prevent osteoporosis.

Define areas where pharmacists can improve osteoporosis prevention.

Self Assessment Questions:

What are modifiable risk factors for osteoporosis?

What are complications of osteoporosis?

EVALUATION OF ANTIFUNGAL PRESCRIBING PRACTICES IN A NON-TRANSPLANT HOSPITAL FOLLOWING IMPLEMENTATION OF AN UPDATED FEBRILE NEUTROPENIA ORDER SET

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Objective:
Febrile neutropenia is a frequent complication of chemotherapy and patients with profound or prolonged neutropenia are at an increased risk of developing bacterial or fungal infection(s). Literature suggests up to one-third of febrile neutropenia patients unresponsive to appropriate antibiotic therapy after seven days develop invasive fungal infections. Traditionally, amphotericin B has been the gold standard for prolonged febrile neutropenia, but is associated with significant toxicity. Fluconazole and newer antifungal agents (liposomal formulations of amphotericin B, itraconazole, voriconazole, and caspofungin) offer less toxic alternatives. The current febrile neutropenia order set at St. Joseph Mercy Hospital will be updated to replace amphotericin B with fluconazole for patients without evidence of infection and voriconazole for patients with possible aspergillus infection. Antifungal prescribing practices will be evaluated before and after implementation of the updated order set. The primary objective of this study is to improve the timely initiation or consideration of antifungal therapy between days four and seven in patients with prolonged febrile neutropenia. Secondary objectives include evaluation of the length of hospitalization, days until defervescence, and incidence of breakthrough fungal infection and ICU admission.

Methodology:
The prolonged febrile neutropenia order set will incorporate antifungal recommendations based on institutional fungal patterns and susceptibilities, national practice guidelines, and primary literature on the treatment of prolonged febrile neutropenia. The order set will be implemented into a computerized physician order entry system and education will be provided to internal medicine, oncology, and infectious diseases physicians. Patients with an absolute neutrophil count of less than 500 and an oral temperature greater than 101 degrees Fahrenheit will be included in the study. A prospective analysis of antifungal prescribing after implementation of the order set will be compared to historical case controls. Results will be analyzed and presented at the Great Lakes Conference.

Learning Objectives:

To identify when patients are at risk for fungal infection and when antifungal therapy should be initiated for patients with febrile neutropenia.

To identify the common fungal pathogens in patients with prolonged febrile neutropenia.

Self Assessment Questions:

What are the differences in spectrum of activity between Fluconazole and Voriconazole?

What are the most common sites of Aspergillus infection?

SAFETY AND EFFICACY OF PANTOPRAZOLE COMPARED TO FAMOTIDINE FOR THE PREVENTION OF STRESS RELATED MUCOSAL DAMAGE (SRMD) IN MECHANICALLY VENTILATED INTENSIVE CARE UNIT (ICU) PATIENTS

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This is a retrospective observational study comparing the safety and efficacy of pantoprazole to famotidine in mechanically ventilated ICU patients who require SRMD prophylaxis. The protocol has been submitted to the IRB and is currently pending approval.

Gastroduodenal erosions are common in patients who have experienced a major stressful event such as trauma, surgery, organ failure, sepsis, or thermal injury. These erosions can lead to ulceration and bleeding. In critically ill patients the protective barrier of the gastrointestinal (GI) tract is broken down. This coupled with the hypersecretion of acid, the release of stress mediators, and a reduction in mucosal blood flow can result in SRMD and an increased risk of hemorrhage. The rate of clinically important bleeding in critically ill patients not receiving SRMD prophylaxis ranges between 0.1 – 39%. In addition, the definition of clinically important bleeding is variable among authors. Several studies have determined that independent risk factors such as mechanical ventilation for greater than 48 hours and coagulopathy place critically ill patients at an increased risk for overt or clinically significant bleeding. Other risk factors associated with clinically important bleeding include recent major surgery, major trauma, severe burns, head trauma, hepatic or renal disease at admission, sepsis, and hypotension.

Patients included will be ≥ 18 years old, admitted to the medical or cardiac intensive care units, mechanically ventilated for at least 48 hours, and received either intravenous famotidine or pantoprazole. Patients will be excluded if admitted for pneumonia or a GI bleed, or if they suffered a GI bleed 48 hours before or 24 hours after admission, or have a contraindication to either of the medications. The primary efficacy endpoint is clinically significant bleeding resulting in clinical deterioration necessitating treatment. Secondary endpoints include mortality, the incidence of ventilator-associated pneumonia, and phlebitis.

Learning Objectives:

List the risk factors and complications associated with stress related mucosal bleeding.

Describe the clinical outcomes of mechanically ventilated patients who received injectable pantoprazole compared to injectable famotidine for the prevention of stress related mucosal damage.

Self Assessment Questions:

Is there a decreased incidence of gastrointestinal bleeding associated with injectable pantoprazole compared to injectable famotidine?

Is injectable pantoprazole therapy associated with better outcomes compared to famotidine therapy?

PHARMACISTS' AND PATIENTS' EXPECTATIONS OF MEDICATION THERAPY MANAGEMENT SERVICES IN THE CHAIN COMMUNITY PHARMACY SETTING

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Objective:
Passage of the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 has many implications for both pharmacists and patients throughout the United States. In light of the recent legislation, it is crucial that policies and procedures for Medication Therapy Management (MTM) Services be developed and ready for implementation by 2006 when the Medicare Part D benefits will take effect. Before MTM programs are developed it is important to gather information regarding pharmacists' and patients' expectations of medication therapy management activities. The primary objective of this study is to determine pharmacists' and patients' perceptions and expectations of medication therapy management services in a chain community pharmacy setting.
Methods:
The study questionnaire will be administered to a convenience sample of pharmacists and patients who meet the studies inclusion criteria. Thirty Chicago metropolitan area chain pharmacy locations will be targeted for survey distribution. Questionnaires will be distributed in 10 stores with pharmacists who are currently involved as generalists in advanced patient care activities, 10 stores with Diabetes Care Pharmacists, and 10 stores with no formalized patient care activities.
Results:
Responses to the study questionnaire will provide pharmacists' and patients' expectations of MTM services in a defined chain community pharmacy setting. Data obtained for pharmacists versus is expected to vary, including differences in non-identifiable patient demographic information collected. Data generated will provide descriptive statistics which will be evaluated via a Kruskall-Wallis analysis.
Conclusions:
It is expected that pharmacists' and patients' expectations of MTM services will be identified and this information will be of great benefit. It may help the profession and employers to determine what further education is needed in order to promote professional care activities among pharmacists. In addition, it may provide valuable information on patient expectations of community pharmacists in respect to providing MTM services.

Learning Objectives:

Discuss pharmacists' and patients' expectations of medication therapy management services in the chain community pharmacy setting.

Identify what further education may be needed in order to prepare pharmacists and patients for future medication therapy management services.

Self Assessment Questions:

A significant provision in the Medicare legislation passed in 2003 is the requirement that plans offering Medicare Part D benefits to patients must develop Medication Therapy Management (MTM) services and compensate pharmacists or other designated health care providers for providing these services. T/ F

Which of the groups listed below would meet the criteria for qualification as a “targeted beneficiary” under Medicare Part D?
(A) Patients who have multiple chronic diseases (e.g., diabetes, asthma,
hypertension, hyperlipidemia, congestive heart failure)
(B) Patients who are taking multiple medications covered by Part D
(C) Patients who are identified as likely to incur annual costs for covered
part D drugs that exceed a level specified by the Secretary of Health
and Human Services
(D) All of the above

COMPARISON OF USE OF NSAIDS VERSUS COX-2 INHIBITORS ON THE RATE OF HOSPITALIZATION IN CONGESTIVE HEART FAILURE PATIENTS

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Purpose: Nonsteroidal anti-inflammatory drugs (NSAIDs) and selective cyclooxygenase-2 (COX-2) inhibitors have been suggested in the literature to contribute to congestive heart failure (CHF) exacerbations. The primary objective of this study is to compare rates of hospitalization due to CHF in patients taking NSAIDs, COX-2 inhibitors, or neither.

Methods: A retrospective chart review at the IU-Methodist Family Practice Center of Clarian Health Partners will be conducted to compare the occurrence of cardiovascular outcomes in CHF patients receiving NSAIDs, COX-2 inhibitors, or neither. The primary outcome is hospitalization due to CHF exacerbation. Secondary outcomes include: hospitalization due to myocardial infarction, hospitalization due to unstable angina, and comparison of blood pressure between the groups. A list of patients with a current diagnosis of CHF will be generated utilizing the computerized medical record system from the IU-Methodist Family Practice Center. By accessing the Clarian CareWeb database, each patient's hospital discharge summary will be reviewed for the primary and secondary outcomes mentioned above.

Results: One hundred patient charts qualified for inclusion in this study. Of the 100 patients with CHF, 27% were receiving traditional NSAIDs, 9% were receiving COX-2 inhibitors, and 64% were receiving neither traditional NSAIDs nor COX-2 inhibitors. The primary outcome (hospitalization due to CHF exacerbation) was reached 26 times in the NSAID group (average 0.96/patient), 8 times in the COX-2 inhibitor group (average 0.89/patient), and 57 times in the group taking neither (average 0.88/patient). Average blood pressures were 131/75 mmHg, 140/79 mmHg, and 130/77 mmHg for the NSAID, COX-2 inhibitor, and group taking neither, respectively.

Conclusions: Although the NSAID group has a numerically higher average number of hospitalizations due to heart failure exacerbations, it is unknown at this time if this is a statistically significant difference. Further conclusions will be presented pending statistical analysis.

Learning Objectives:

Understand the mechanism by which NSAIDs and COX-2 inhibitors can increase the risk for heart failure exacerbations.

Identify two other conditions in which the use of NSAIDs or COX-2 inhibitors may potentially increase a patient's risk for an adverse event.

Self Assessment Questions:

T F Studies examining the use of NSAIDs in patients with heart failure have found no significant increase in the risk of exacerbations.

T F COX-2 inhibitors have been found to increase the risk for myocardial infarction; however, the increased risk of heart failure exacerbation prompted removal of rofecoxib from the market.

PREVENTION OF ATRIAL FIBRILLATION FOLLOWING NON-CARDIAC OPEN-CHEST SURGERY.

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Atrial fibrillation (AF) occurs commonly following non-cardiac thoracic surgery, and is associated with increased mortality, prolonged length of hospital stay, and increased resource utilization. The proposed study will provide information regarding the efficacy of amiodarone for prevention of AF following non-cardiac thoracic surgery. The purpose of this study is to a) determine the effectiveness of amiodarone for prevention of AF following non-cardiac thoracic surgery b) determine the influence of prevention of AF following non-cardiac thoracic surgery on post-surgical duration of stay in the ICU c) determine the safety of amiodarone for prevention of AF following non-cardiac thoracic surgery.
A total of 130 consecutive patients who are undergoing lobectomy, esophagectomy, or pneumonectomy will be enrolled. All patients will undergo a preoperative ECG and chest X-ray. At the induction of anesthesia, patients randomized to the amiodarone group will receive a continuous intravenous infusion of amiodarone 1050 mg over 24 hours. On postoperative day 1, intravenous amiodarone will be discontinued and therapy will be initiated with oral amiodarone at a dose of 400 mg orally two times daily for 6 additional days or until hospital discharge whichever occurs first. Daily ECGs will be evaluated for determination of rhythm, and the patient will be monitored for signs and symptoms of AF. Patients who experience AF will be medically managed at their physician's discretion with rate and/or rhythm control and/or anticoagulation. Patients who develop AF will be monitored for adverse clinical effects secondary to AF (i.e. pulmonary edema, stroke and heart failure.)
The incidence of postoperative AF, duration of post-surgical ICU and hospital stay, and incidence of side effects associated with amiodarone in the two groups will be compared. Currently we have 30 patients enrolled and preliminary data will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

List the risk factors for development of AF following non-cardiac thoracic surgery

Describe the use of amiodarone in preventing AF after coronary artery bypass graft surgery (CABG) surgery.

Self Assessment Questions:

Amiodarone has been shown to decrease the rates of postoperative AF, reduce hospital costs and, in some studies, reduce length of hospital stay. (T/F)

Atrial fibrillation is the most common arrhythmia following non-cardiac thoracic surgery. (T/F)

ASSESSMENT OF ASHP ACCREDITATION COMPLIANCE AND OPINIONS OF PROPOSED ASHP ACCREDITATION STANDARDS IN DRUG INFORMATION RESIDENCY PROGRAMS

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Background/Purpose: Proposed ASHP accreditation standards introduce new terminology of postgraduate year 1 (PGY1) and postgraduate year 2 (PGY2) to reinforce the idea that specialized residents first complete a pharmacy practice residency. This reinforcement combined with increased length of pharmacy education, various opportunities for pharmacy graduates, and lack of CMS funding for specialty residencies, could decrease the availability of drug information residency-trained specialists. The purpose of this study is to benchmark compliance of certain ASHP accreditation standards in ASHP-accredited and non-accredited drug information residencies; gather the opinions of residency program directors (RPDs) on the proposed standards; and determine future program accreditation plans.

Methods: A web-based survey was e-mailed to forty-three drug information RPDs. Survey content included questions addressing program demographics; RPD, preceptor, and resident qualifications; RPD opinions of proposed standards; and future program plans.

Preliminary results/Conclusion: Data collection is in progress and will be collected on February 7th, 2005. Data will be analyzed and submitted to the ASHP Commission on Credentialing. Data will also be presented at the Great Lakes Residency Pharmacy Conference.

Learning Objectives:

To benchmark compliance of certain ASHP accreditation standards in ASHP-accredited and non-accredited drug information residency programs.

To determine RPD thoughts on proposed ASHP accreditation standards.

Self Assessment Questions:

Are drug information residency programs in compliance with RPD, preceptor, and residency candidate qualifications?

What do drug information RPDs think about proposed ASHP accreditation standards?

OUTCOMES EVALUATION OF ACETAMINOPHEN OVERDOSE GUIDELINES WITHIN THE HEALTH ALLIANCE

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Background: Acetaminophen is a common cause of toxic ingestions in the United States. It is estimated that it accounts for more than 56,000 emergency room visits and 2,000 hospitalizations. It is also associated with approximately 458 deaths due to acute liver failure annually. The management of patients who present after toxic amount of acetaminophen is complex. The Health Alliance has recently developed guidelines to establish the standard of care for the management of acetaminophen overdose in adults. Our aim was to provide evidence based recommendations, easy to follow clinical practice guidelines that will guide physicians through the investigation and management of patients presenting to the hospital after acetaminophen overdose.

Objectives: The primary objective is to determine prescribers' compliance rate with the newly implemented clinical practice guidelines. The secondary objective is to evaluate the occurrence of adverse effects, hospital length of stay, and overall mortality rate between pre- and post-implementation groups.

Methods: A retrospective, multi-center (5 centers), single system study is being conducted for patients admitted to any Health Alliance hospital between January 2003 and September 2004 (pre-implementation) and between October 2004 and March 2005 (post-implementation). Patients >18 years of age with an initial diagnosis of acetaminophen overdose are eligible for inclusion in the study. Pregnant women and minors (<18 years old) are excluded from the study. The hospitals' electronic medical record system is being used to obtain the following pertinent data: patient demographics (age, gender, weight, allergies), N-acetylcysteine regimen (dose, route, frequency, length of therapy), serum laboratory information (acetaminophen level, alanine aminotransferase, aspartate aminotransferase, international normalized ratio, albumin, bilirubin, renal profile), length of hospital stay, and mortality rate.

Results: Data collection is ongoing. The results will be analyzed and presented at the Great Lake Conference.

Learning Objectives:

Discuss the current Health Alliance guidelines for the management of acetaminophen overdose.

Be able to identify the most common adverse effects that are associated with the use of either oral or intravenous formulations of N-acetylcysteine.

Self Assessment Questions:

True or False – Hepatotoxicity due to acetaminophen overdose is related to the conversion of acetaminophen to a highly reactive intermediate N-acetyl-p-benzoquinoneimine once glutathione and sulfate pathways become saturated.

True or False – Intravenous N-acetylcysteine is safe and effective for the treatment of acetaminophen toxicity, but is more expensive and carries a higher risk of adverse reactions compared to the oral dosage form.

MEDICATION RECONCILIATION: PATIENT SAFETY ACROSS THE HEALTHCARE CONTINUUM

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It has been documented that many medication errors occur at transitions of care. Many of these errors can be prevented by the reconciliation of medications. Reconciling medications is defined by the Joint Commission on Accreditation of Health Care Organizations as the process of obtaining a list of the patient's current medications and comparing that list to the physician's admission, transfer, and/or discharge orders. A complete, accurate medication history is of vital importance in this process.

This study will compare the medication list from the family practice setting with the hospital's medication history and admitting orders to determine the frequency of unreconciled medications.

The goal is to determine the frequency of unreconciled medications, document the extent of errors and omissions associated with the current admission process, and implement a medication wallet card program as a strategy to improve the process.

Twenty family practice patients admitted to the hospital will be randomly selected and screened for the exclusion criteria. A team including a physician, pharmacist, and nurse will retrospectively review the family practice and hospital charts. The reviewers will compare the current medication list from the family practice center against the hospital's admitting history and orders. Any discrepancy that is not supported by documentation regarding the reason(s) for variation in the medication order will be counted as unreconciled. Once the problem is defined, the review team will formulate action plans to improve the process and engage a multidisciplinary team within the clinic to develop a medication wallet card program. The team will track how many medication wallet cards are issued to patients over four weeks.

The study will use the percent of medications unreconciled and the number of medication wallet cards distributed to patients as the primary measures to evaluate the process.
The results and conclusions will be presented at the conference.

Learning Objectives:

Understand the lack of continuity between inpatient and outpatient care, by way of the medication reconciliation process.

Explore strategies to improve medication reconciliation by developing a structural and accessible home medication list.

Self Assessment Questions:

True or False: A complete and accurate home medications list reduces medication errors at admission and also sets the stage for discharge.

True of False: The use of a wallet card in the outpatient setting may help reduce medication errors across the healthcare system.

EFFICACY AND TOXICITY ANALYSIS OF A CONTINUOUS RENAL REPLACEMENT THERAPY (CRRT) DOSING TABLE FOR NON-ANTIMICROBIAL DRUGS

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Continuous renal replacement therapy (CRRT) has the potential to remove drugs as well as fluid and electrolytes, necessitating adjusted drug dosing. The University of Wisconsin Hospital and Clinics (UWHC) uses an individualized CRRT dosing table for antimicrobials based on ultrafiltrate rate, patient weight, and drug kinetic parameters. The purpose of this study is to expand the dosing table to include several non-antimicrobial drugs and to validate the table by assessing the efficacy and toxicity of the drugs dosed based on the table. The drugs selected for the study are cyclosporine, tacrolimus, digoxin, metoclopramide, ranitidine, pantoprazole, phenobarbital, phenytoin, gabapentin, and valproic acid. Drugs were added to the CRRT table with the use of a formula developed by M. Schetz (Intensive Care Med 1995). The study methods consist of retrospective and prospective parts. The retrospective part will review the drug dosing and outcomes of patients receiving CRRT and at least one of the studied drugs. Data to be collected are efficacy and toxicity indicators per predefined criteria and the average numbers of drug level draws and dosing changes needed. The retrospective data will provide a comparison of how current drug dosing would differ from standardized drug dosing with a CRRT dosing table. The prospective part of the study involves implementation of the CRRT dosing table for all patients receiving CRRT and at least one of the studied drugs. The unit pharmacists will recommend dosing adjustments to prescribers based on the CRRT table. Outcomes will be measured as percentages of patients showing evidence of efficacy or toxicity based on predefined criteria for each drug.
Data collection is in progress. Preliminary results are pending.

Learning Objectives:

Identify the factors that influence drug removal by CRRT.

Calculate adjusted drug doses for patients receiving CRRT, based on patient weight, ultrafiltrate rate, and drug kinetic parameters.

Self Assessment Questions:

List two factors that influence drug removal by CRRT.

T/F: Metoclopramide dosing with CVVH has been studied in a randomized, controlled trial.

EVALUATION AND IMPLEMENTATION OF PHARMACY INTERVENTION DOCUMENTATION PROGRAM

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The cost impact of capturing pharmacist interventions is an important goal for pharmacy departments. At WBH-RO, the current documentation and reporting of pharmacists' interventions is limited by: system availability on the Pharmacy Department server, ambiguous intervention category selection, and reporting capabilities. Commercially available pharmacy intervention documentation programs may overcome these limitations.

The goal of this project is to evaluate and pilot a commercially available intervention tracking program, which will meet the needs of the Department of Pharmaceutical Services. Three commercially available intervention tracking programs were identified for this project. To aid in the selection of the intervention program, the clinical and administrative pharmacy staff will be surveyed to identify the most desirable characteristics of an intervention program. A comparison table will be created utilizing the desirable characteristics to evaluate the intervention programs. Based on the survey results, these identified characteristics will be assigned point values. Each intervention program will be evaluated using the comparison chart by entering a sample of 100 interventions. The program that achieves the highest score will be selected for a 2-month pilot. Customizations will be made to the program to meet the needs of the department. The list of intervention categories will be created combining drug-related problems (e.g. added needed therapy, subtherapeutic dose) and current hospital interventions (e.g. clarify drug, clarify indication). A literature search will be done to establish how to assign cost savings to each intervention category. Once the customizations are complete, the clinical and administrative pharmacy staff will be educated on operating the documentation program. The pharmacist-initiated interventions will be entered into the selected documentation program for a 2-month pilot starting January 3rd until February 28th.

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

Learning Objectives:

Upon completion of this program, the participant will be able to:
o Select a pharmacist intervention tracking program for their health system's use

o Establish cost savings associated with pharmacists' interventions

Self Assessment Questions:

The literature available on pharmacists' interventions agrees on how to assign cost savings to the cognitive services. T/F

Documentation of pharmacist interventions can be used to capture cost savings/avoidance and assess performance. T/F

A COMPARISON OF CRITICALLY ILL PATIENTS PLACED ON AN INTENSIVE INSULIN PROTOCOL VS "STANDARD" CARE

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BACKGROUND: Glucose dysregulation in the critically ill is a common phenomenon due to physiological stresses such as trauma, surgical procedures, and medical illness such as sepsis and shock. Glucose dysregulation occurs in both patients with or without a previous history of diabetes. Hyperglycemia in critically ill patients results in an increased mortality and morbidity such as increased infections rates and impaired wound healing. Recent studies have suggested intensive use of insulin to control hyperglycemia in the critically ill patients will decrease both morbidity and mortality. Intensive insulin control varied in theses studies with blood glucose goals of 80-110mg/dL to 90-145mg/dL.

After reviewing the literature, St Charles Mercy Hospital initiated an intensive insulin protocol in both the MICU/SICU and CICU utilizing a scale of 80-130mg/dL.

METHODS: Patient charts were reviewed retrospectively that had been initiated on the intensive insulin protocol in both the M/SICU and the CICU with an equal number of patients that received "standard" glycemic control. The primary objective was to evaluate the safety and effectiveness of intensive insulin control in the critically ill patient. Secondary outcomes include, all cause mortality, rate of infections, and length of stay in the ICU. With a defined protocol in place, data was collected on hospital length of stay, ICU length of stay, time to reach target blood sugar, readings above and below protocol range, protocol violations, infections (confirmed by WBC, radiological findings and cultures), use of vasopressors, APACHE II scores, initiation of TPN or tube feeds, use of steroids, renal function, and the reason for discontinuation.

RESULTS: Data collection and analysis is currently in progress. Results and conclusion will be presented.

Learning Objectives:

Discuss the advantages of tight glycemic control in the critically ill.

Describe complications of hyperglycemia in the critically ill patient.

Self Assessment Questions:

A critically ill patient without a previous diagnosis of diabetes is unlikely to require glycemic control while in the ICU.
True or False

List three possible causes of hyperglycemia in the critically ill patient.

CLINICAL AND ECONOMIC IMPACT OF ALLERGIES TO ANITBACTERIALS

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Many patients report allergic reactions to antibacterial agents. The primary objective of this study is to determine the cost differential between patients' actual antibacterial regimens and what therapy would have been prescribed had there been no history of allergies to antibacterials. Additionally we will attempt to determine the frequency the reported allergies are likely to be true hypersensitivity reactions.

Part one of the study (approximately three months) includes inpatients who had antibacterial allergies and received antibacterials during their hospitalization. The medical record is being reviewed to obtain demographic and clinical data. A "standard regimen," that which presumably would have been used if no allergy had been present, is being determined. The "standard regimen" is based on institutional guidelines for treatment or prophylaxis or if not available, an infectious disease specialist is reviewing the patient's history and determining the "standard regimen". The cost of the actual therapy and the "standard regimen" will be determined and the difference calculated.

Part two will include the third month of part one. In addition to the data collected in part one, an attempt will be made to determine the validity of the reported allergy. After informed consent is obtained, patients will be interviewed for specifics about their history of allergies to antibacterial agents, the reactions that occurred, and exposure to other antibacterials. The reactions will be rated utilizing the Naranjo algorithm.

Data collected will provide a measure of the frequency with which antibacterials regimens are altered due to allergy histories and the validity of those histories. The information will be used to evaluate cost savings through more thorough investigation into reported allergies to antibacterials.

Data collection and evaluation are in progress. The results and conclusions will be presented at the conference.

Learning Objectives:

Discuss the incidence of reported allergies to antibacterial agents.

Evaluate the importance of accurate history taking and documentation regarding histories of allergies to antibacterials.

Self Assessment Questions:

True or False: A history of allergic reactions may increase the cost of antibacterial therapy in hospitalized patients.

True or False: Allergy information regarding antibacterials is often inaccurately documented in hospital databases.

THE COULEE REGION COMMUNITY PHARMACY ASTHMA INTERVENTION STUDY

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Statement of purpose:
To examine the effectiveness of communication between community pharmacists and healthcare providers treating a population of patients that excessively uses short-acting beta2 agonists (SAB2A) for asthma symptom relief. The study will assess the utility of a faxed communication summarizing a community pharmacist's evaluation of inhaler technique, adherence, and possible recommendation to adjust current drug therapy based on national asthma guidelines.
Methods:
A prospective, interventional, quasi-experimental study with a post-test design will be conducted October 1, 2004 to January 31, 2005 in the Coulee Region of Wisconsin and Minnesota in community/clinic pharmacies. Voluntary participants will consist of men and women ages 12 to 60 who have received three or more canisters of their SAB2A in the past 90 days for relief of asthma symptoms. Patients with comorbidities of the lung, patients who take oral steroids on a regular basis, and patients who have lost their SAB2A will be excluded.
Upon detection of excessive use of SAB2A, a community pharmacist will conduct an evaluation of the patient's inhaler technique and adherence to prescribed controller therapy. The conclusions of the community pharmacist's evaluation will be faxed to the patient's healthcare provider. The pharmacist may or may not include a patient specific drug therapy recommendation depending on the patient's demonstration of inhaler technique and adherence to prescribed controller therapy based on an established protocol.
Fischer's Exact Test will assess if fax communication is more helpful to healthcare providers when a drug therapy recommendation is made versus when no recommendation is made in conjunction with a community pharmacist's patient evaluation. Significance of data collected will be determined at the $p < 0.05$ level.
Secondarily, data from demographic surveys will be used to compare subsets of the population.
Results: To be reported after data analysis has been completed.
Conclusion: To be reported after data analysis has been completed.

Learning Objectives:

To understand the role of the community pharmacist in monitoring and assisting patients who suffer from asthma.

To understand how facsimile communication between community pharmacists and health care providers can facilitate patient's needs.

Self Assessment Questions:

Which of the following is not a recommendation by the National Asthma Education Prevention Program (NAEPP) for community pharmacists to assist with helping patients control their asthma?
(a) Instruct patients on proper inhaler technique
(b) Monitor medication use and refill intervals to help identify poorly controlled asthma
(c) Encourage patients to purchase non-prescription inhalers
(d) Encourage the use of asthma management action plans

Of the following schedules of use for Advair 1 puff BID, which is considered “non- adherent” to the medication?
(a) October 13, 2004 #60, November 9, 2004 #60, December 11, 2004 #60
(b) October 13, 2004 #120, December 11, 2004 #120
(c) October 1, 2004 #120, November 30, 2004 #120
(d) October 1, 2004 #60, December 30, 2004 #60, February 30, 2005 #60

IMPACT OF NESIRITIDE ON READMISSION RATES IN PATIENTS WITH ACUTE DECOMPENSATED HEART FAILURE

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Background: Hospital readmission for acute decompensated heart failure (ADHF) is common. Readmission rates of ADHF patients are as high as 20% at 30 days and 50% at 6 months. Nesiritide is a recombinant human brain natriuretic peptide that has been theorized to reduce hospital readmission rates due to ADHF.

Purpose: The purpose of this study is to compare the rate of hospital readmission for ADHF between patients treated with nesiritide and those treated with standard therapy.

Methods: Study subjects will be identified from a subset of patients from our institution enrolled in the Acute Decompensated Heart Failure Registry (ADHERE), a Phase IV, retrospective, multicenter, observational, open-label registry of patients with ADHF. Subjects treated with nesiritide (experimental group) will be identified by both hospital pharmacy records and the ADHERE database. The control group will consist of ADHF patients treated with standard therapy, excluding nesiritide, matched for age, gender, and left ventricular ejection fraction. Demographic and clinical data will be extracted from patients' medical records. The primary and secondary endpoints are ADHF hospital readmission at 90 days and 12 months, respectively. Baseline characteristics, concurrent ADHF therapy, time to readmission, and number of redmissions will also be compared. Data analysis will be based on descriptive statistics.

Results: Between January, 2002 and September, 2004, 798 patients with ADHF were enrolled in ADHERE at our institution. Of these, 88 (11%) were treated with nesiritide. Therefore, we anticipate a sample size of approximately 176 patients; 88 patients in both the nesiritide and control groups, respectively.

Conclusions: Hospital readmission is common in patients with ADHF. Nesiritide has been suggested to decrease ADHF readmissions in previous studies. We hope this analysis provides more definitive information regarding the ability of nesiritide to reduce hospital readmissions for ADHF.

Learning Objectives:

Recognize the impact of acute decompensated heart failure on hospital readmission rates.

Describe the pharmacology of nesiritide and its role in the treatment of acute decompensated heart failure.

Self Assessment Questions:

The rates of hospital readmission due to acute decompensated heart failure continue to increase over time.
T or F

Nesiritide causes diuresis, natriuresis, and lowering of ventricular filling pressures.
T or F

RETROSPECTIVE ANALYSIS OF SILDENAFIL USE FOR TREATMENT OF POST-OPERATIVE PULMONARY HYPERTENSION IN PEDIATRIC CARDIOVASCULAR PATIENTS.

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Congenital heart defects, such as atrioventricular canal and transposition of the great vessels, as well as cardiovascular surgery are major risk factors for development of pulmonary hypertension (PHTN) in children. This is thought to be secondary to increased pulmonary vascular resistance as a result of a dysfunction in endogenous pulmonary endothelial nitric oxide (NO) production. Nitric oxide production is mediated by cyclic guanidine monophosphate (cGMP), which is broken down by phosphodiesterase type 5 (PDE5) in the lung. There are limited pharmacological interventions for PHTN in children. Sildenafil is a selective inhibitor of PDE5 with the potential to vasodilate pulmonary vessels with minimal systemic effects. The objective of this study was to determine the efficacy of sildenafil for post-operative PHTN in children after cardiac surgery.

Charts were reviewed for children who received sildenafil after cardiovascular surgery from January 2003 to November 2004. Sildenafil and nitric oxide dosing and administration data were collected. Pulmonary and systemic systolic blood pressures, arterial blood gases, and oxygen saturations were evaluated when available at baseline prior to the dose, then 30 minutes, 1 and 2 hours after dose administration.

To date, 27 of the 55 identified patients have been reviewed. The mean initial dose was 0.3 mg/kg every 6 hours, ranging from 0.13 – 0.62 mg/kg/dose every 4 – 6 hours. The mean maximum dose was 0.42 mg/kg/dose ranging from 0.17 – 1.1 mg/kg/dose. Patients were treated for an average of 19.7 days. The mean duration of sildenafil with NO therapy was 3.9 days. Preliminary evaluation has shown a trend towards decreased systolic pulmonary artery pressures (PAP) after sildenafil dosing. The mean percentage decrease in PAP at 1 and 2 hours after dosing was 4.2% and 7.8%, respectively. Data collection is still ongoing, and final conclusions cannot be made at this time.

Learning Objectives:

To identify the pathways by which PHTN occurs in the pediatric cardiovascular population.

To understand the mechanism and role sildenafil has for the treatment of PHTN and monitoring parameters for assessment of its efficacy.

Self Assessment Questions:

What types of congenital heart diseases put a patient at a higher risk for PHTN?

A direct relationship has been seen between sildenafil dosing and decrease in pulmonary vascular resistance. T or F

HEALTH ALLIANCE HEPARIN MEDICATION UTILIZATION EVALUATION

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The Health Alliance consists of a six-hospital health system located in Cincinnati, Ohio. The Health Alliance practices the weight based heparin nomogram developed by Raschke and colleagues. Lab values of the aPTT (activated prothrombin time) are highly specific for each respective lab's reagent. As of August 5, 2004, the Health Alliance experienced a reagent changeover for aPTT testing, resulting in an increased target value for aPTT levels. To guarantee patient safety and optimal treatment outcomes due to the change in target aPTTs, a medication utilization evaluation was initiated at the Health Alliance.

The primary objective monitored the frequency of patients effectively anticoagulated within the first 24 hours of treatment. Incidence of adverse bleeding events and reasons for discontinuation of therapy were also documented in these patients as secondary objectives. Data was collected retrospectively by patient charts from each Health Alliance institution. Data was processed at the Jewish Hospital.

Summary of Results: A total of 145 patient charts were reviewed. Charts were dated from August 5, 2004 to October 2004. Final results were able to be collected from 119 patients. Within 24 hours of therapy, 83% of patients receiving weight based heparin achieved therapeutic aPTTs. Major bleeding events occurred in 4 patients. Reasons for discontinuation included: withdrawal of care, heparin induced thrombocytopenia, major bleeding events, or death.

Conclusions: The weight based nomogram continues to provide effective anticoagulation outcomes for the Health Alliance despite changes in therapeutic aPTT ranges. Variance of primary outcome results compared to previous findings were expected, due to collection of data from a real-life, multi-institutional setting. Major bleeding events were minimal, in addition to other adverse events. The Health Alliance plans to continue practicing the weight based heparin nomogram developed by Raschke and colleagues.

Learning Objectives:

Understand why therapeutic ranges for aPTT monitoring change when lab reagent lots are replaced.

Become familiar with major bleeding events to watch and monitor for when patients are receiving intravenous heparin therapy.

Self Assessment Questions:

Raschke and colleagues found that weight based heparin dosing provided effective anticoagulation at the dose of:
a.Bolus = 100units/kg, followed by an infusion of 15units/kg/hr
b.Bolus = 90 units/kg, followed by an infusion of 17 units/kg/hr
c.Bolus = 80 units/kg, followed by an infusion of 18units/kg/hr
d.Bolus = 70 units/kg, followed by an infusion of 20 units/kg/hr

If patients achieve therapeutic aPTTs _____ hrs upon initiation of the weight based heparin bolus and infusion, clinical studies have shown that incidence of thromboembolic events significantly decreases.
a.12 hours
b.24 hours
c.36 hours
d.48 hours

IMPLEMENTATION OF A MONITORING TOOL FOR METABOLIC SIDE-EFFECTS OF SECOND-GENERATION ANTIPSYCHOTICS

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Background: Second-generation antipsychotics (SGAs) are an important treatment option for many psychotic conditions. Currently there are six second-generation antipsychotics available: clozapine, risperidone, olanzapine, quetiapine, ziprasidone, and aripiprazole. Most of these medications have become first-line for many psychotic illnesses and other psychiatric conditions because they exhibit fewer extrapyramidal side effects and are more effective at treating negative symptoms than first generation antipsychotics. However, their use has been associated with reports of dramatic weight gain, diabetes, and dyslipidemia. These side effects are significant risk factors for cardiovascular disease (CVD). In addition, side effects such as weight gain may significantly affect compliance, and also, quality of life.
In November of 2003, a panel of experts convened from the American Diabetes Association, American Psychiatric Association, American Association of Clinical Endocrinologists, and North American Association for the Study of Obesity. This group created a consensus statement on antipsychotic drugs and their relationship with diabetes and obesity.
Purpose: Based on the available information regarding SGAs, the Consensus Panel has recommended appropriate monitoring parameters for metabolic side-effects, as well as a timeline for monitoring. Therefore, the purpose of this project is to increase awareness among clinicians of the potential risks of SGA therapy and provide guidance regarding the recommended monitoring for CVD risk factors.
Methods: A multidisciplinary approach has been taken to address these recommendation. A monitoring tool for CVD risk factors for patients in the psychiatry unit who are on SGA therapy was created and will be implemented in February 2005. In addition, the psychiatry department admission order form was revised to reflect suggested monitoring parameters. Patient-centered outcomes will be assessed beginning in February 2005. Physician compliance and satisfaction with the monitoring tool will be also be evaluated.
Results/Conclusion: Yet to be determined.

Learning Objectives:

List six key parameters to monitor when patients are on SGA therapy.

Describe the complexity of developing and implementing a monitoring tool in the hospital setting.

Self Assessment Questions:

The purpose of the 2003 Consensus Development Conference on Antipsychotic Drugs and Obesity and Diabetes was to:
a) Better understand the relationship between SGAs and the development of major CVD risk factors.
b) Identify appropriate screening and monitoring parameters for patients on long-term SGA therapy.
c) Persuade clinicians to not use SGA therapy because of the recent discovery of potentially significant side effects.
d) All of the above
e) a and b only

A 32 year old female was admitted to the psychiatric unit and started on SGA therapy two weeks ago. Before initiation, she weighed 125 lbs, and she has since gained 8 lbs. Your recommendation is:
a) Stop therapy immediately. Do not start another SGA because she would likely gain weight no matter what drug is chosen.
b) Inquire about her psychiatric symptoms and diet and activity level since hospital admission.
c) Immediately switch to another SGA, and continue to monitor her weight.
d) Prescribe an anti-obesity drug; this strategy will be more effective than waiting until she has gained even more weight.

MEDICATION DISCREPANCIES IN HOSPITALIZED SENIOR PATIENTS

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Background: Beginning of January 2006, one of the expectations of hospitals by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) is “to reconcile medications across the continuum of care”. Previous literature has shown that pharmacists may facilitate this process.

Purpose: This descriptive study identified the frequency, type, and severity in discrepancies between medication histories and admission orders in senior patients admitted to a medical-surgical care unit located at a large community-teaching hospital.

Methods: Pharmacists obtained medication histories from a convenience sample of patients aged 55 years and older within 24 hours of admission to a medical-surgical care unit. These medication histories were compared to the patient's admission orders. Medication discrepancies were quantified, typed, and categorized based on the National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) index for categorizing medications errors.

Results: To date, 25 medication histories have been evaluated. The median age of patients was 73.8 (55-96) years old. Medication discrepancies were identified in 60% of patients for a total of 30 medication discrepancies (1.9 per patient). A total of 72% of patients had more than 4 chronic conditions with a median of 6.8 (0-17) prescriptions per patient. Different dosage, route or frequency, not explained by a patient's clinical status at admission occurred in 46% of medication discrepancies requiring clarification. Cardiovascular agents accounted for 36% of the discrepancies requiring clarification and 21.4% were vitamins or electrolytes. Severities ranged from errors that reached the patient, but unlikely to cause harm (67.9%) to errors that could have caused temporary harm requiring prolonged hospitalization (14.3%).

Conclusion: Based on preliminary results, medication discrepancies frequently occur in hospitalized senior patients. Pharmacists' involvement in taking medication histories results in timely collection, verification and validation of medication histories.

Learning Objectives:

List the NCC MERP Index for categorizing medication errors.

Define the 2005 JCAHO goal of “Accurately and completely reconcile medications across the continuum of care” which is expected to be implemented by January 2006.

Self Assessment Questions:

A patient with a medication discrepancy NCC MERP category E has an error that could have caused permanent harm. True or False?

The 2005 JCAHO goal of “Accurately and completely reconcile medications across the continuum of care” will require hospitals to develop a process to obtain and document a complete list of the patient's current medications upon the patient's admission to the organization. True or False?

NOREPINEPHRINE VS PHENYLEPHRINE IN SEPTIC SHOCK: A RETROSPECTIVE REVIEW OF EFFECTS ON HEMODYNAMICS AND ORGAN FUNCTION

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Sepsis is a potentially life threatening condition that results in altered hemodynamics and organ dysfunction. For septic patients with hypotension that is refractory to fluid resuscitation, current guidelines suggest dopamine or norepinephrine as first line vasopressor agents. However, the use of phenylephrine for hemodynamic support in septic patients has been poorly studied.

The purpose of this study is to compare the efficacy of norepinephrine vs phenylephrine with regards to hemodynamic support and organ function preservation.

This study will be a retrospective chart review of patients requiring initial vasopressor therapy with either norepinephrine or phenylephrine for the treatment of septic shock. Patients will be identified using ICD-9 codes for sepsis, septic shock, and severe sepsis. The primary endpoints of the study include time to consistent hemodynamic improvement as well as organ dysfunction. Hemodynamic improvement will be defined by a sustained mean arterial pressure greater than or equal to 65mmHg or a systolic blood pressure greater than or equal to 90mmHg. Organ dysfunction will be defined by sequential organ failure scores.

In order to achieve a power of 80% at an alpha of 0.05, fifty patients are required per group to detect a 30% difference in proportion responding to vasopressor monotherapy. Data collection is currently in process, as such, results will be discussed once collected and analyzed.

Learning Objectives:

To become familiar with current treatment guidelines with regards to vasopressor therapy in septic patients.

To compare differences in time to appropriate hemodynamic response and organ function of patients who received norepinephrine with those who received phenylephrine as primary vasopressor support.

Self Assessment Questions:

T F :According to current treatment guidelines, phenylephrine is considered a first line agent

T F: According to data presented, patients who received phenylephrine achieved an adequate hemodynamic response quicker and more efficiently than those who received norepinephrine.

ANALYSIS OF ORDER ENTRY TIME BETWEEN TWO PHARMACY INFORMATION SYSTEMS

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Healthcare organizations have implemented new information systems in an effort to maximize patient care and optimize workflow. The inpatient pharmacy of Aurora Health Care is planning a conversion of pharmacy information systems over the next 18 months. The objective of this study is to analyze the pharmacist order entry time between the current Mainframe system and a windows-based client server system (PharmNet©). Other goals of this study are to identify barriers and benefits of the new system affecting the speed and accuracy of the order entry.

The overall organization of this study includes two phases, each divided into three components. A combination of direct observation and work sampling methods will be used to determine order entry time. Five full-time pharmacists will be randomly selected to complete both phases of the study. Phase I is the Mainframe study while phase II is the PharmNet© portion. The first component of each phase will be a random pager study to examine the percentage of time pharmacists spend on order entry versus other functions. The second component will be a direct assessment measuring the amount of time required to enter specific types of orders such as unit dose, bulk, IV preparations, and group orders. The final component will consist of the entry of a complete patient profile as a script with a need to research laboratory results. Data will be collected for the second and third components using a stopwatch to directly time the order entry. The data will be compiled and reviewed to determine the differences in order entry time between the two systems.

Data collection is ongoing and will be presented.

Learning Objectives:

Describe the processes involved in evaluating differences in pharmacy computer systems in relation to the pharmacist's daily workflow.

Understand the impact of order entry times on clinical services, cost reduction initiatives, and staffing patterns.

Self Assessment Questions:

Which pair of functions do pharmacists spend most of their workday performing?

a) personal and professional duties
b) travel and order entry
c) order entry and clinical functions
d) technical/distributive and other functions

The amount of time spent on entering orders has no effect on cost or clinical services being provided. (T or F)

AN EVALUATION OF POTASSIUM AND MAGNESIUM REPLACEMENT NOMOGRAM IN THE HEART FAILURE SPECIAL CARE UNIT

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Background: A potassium and magnesium replacement nomogram is being utilized in the heart failure special care unit (HFSCU). The nomogram was developed secondary to a need to improve potassium and magnesium replacement in patients at risk of hypokalemia, hypomagnesemia, and ventricular arrhythmias. The goal of this study is to evaluate the effectiveness of the potassium and magnesium replacement nomogram.

Methods: Over a 3-month period, a concurrent chart review is being conducted in all patients initiated on the potassium and magnesium nomogram in the HFSCU. The primary objective is to assess the number of patients who reach goal potassium (4.0 to 5.0 mmol/L) and magnesium (2.0 to 2.4 mg/dL) during the first 48 hours of nomogram initiation. Secondarily, the length of time it takes for patients to reach goal, concomitant medications that may affect potassium and magnesium levels, as well as the safety of the nomogram will be evaluated. In addition, patients with renal insufficiency will be evaluated as a subgroup.

Preliminary Results: Twenty-five of an estimated 50 patients (mean age: 52.3 years, 68% male) were analyzed. All 25 patients were initiated on the potassium nomogram, 92% (23/25) reached goal potassium within 48 hours of initiation. As for the magnesium nomogram, 15 patients were treated. Of the patients treated, 80% (12/15) reached goal magnesium within 48 hours of initiation. Further results and conclusions will be presented.

Learning Objectives:

Understand the importance of maintaining normal potassium and magnesium in patients with heart failure.

Discuss the methodology and results of this study, and the implications it has for heart failure patients.

Self Assessment Questions:

Hypokalemia is common in patients with heart failure.
(a) True
(b) False

Replacement of potassium is not dependent on magnesium.
(a) True
(b) False

IMPACT OF MECA GENE TESTING ON ANTIMICROBIAL THERAPY FOR STAPHYLOCOCCUS AUREUS BACTEREMIA

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Purpose: Time to appropriate antimicrobial therapy is an important determinant for positive clinical outcomes in patients with Staphylococcus aureus bacteremia (SAB). The mecA gene polymerase chain reaction test is the most accurate for the detection of methicillin-resistant S. aureus (MRSA) and is performed at the University of Michigan Health System (UMHS) routinely. The results are available within 36 hours after a positive culture; however, an additional 2-4 days can elapse before the availability of final antimicrobial susceptibility testing results. Currently many clinicians do not understand the importance of mecA testing, and may not adjust antimicrobial therapy in a timely manner. The objective of this study is to conduct a quality assurance (QA) evaluation to determine the current antimicrobial prescribing patterns (including timing of antistaphylococcal therapy relative to the availability of mecA and susceptibility test results) for SAB at UMHS.

Methods: This QA concurrent surveillance will be conducted over 4 months in approximately 60 inpatients with SAB. Inappropriate antimicrobial therapies will be defined as antibiotics that do not match the in-vivo susceptibility profile of the staphylococcal isolate. Data to be collected include patient demographics, infectious diseases and co-morbidities, allergies, isolated pathogens, and the documented timing of: positive blood culture for S. aureus, mecA gene test results, preliminary and final susceptibility tests, and all antimicrobial agents prescribed. Quantitative and qualitative variables will be presented with a descriptive analysis.

Results: Data collection is currently underway and will be discussed at the time of presentation.

Conclusion: The results of this study may promote the role of the pharmacist in reporting mecA gene test results to prescribers and in adjusting antimicrobial agents accordingly. Appropriate use and reporting of the mecA gene test may ensure results are utilized in a timely manner to ensure optimal antimicrobial therapy for SAB.

Learning Objectives:

1. Explain the significance of appropriate antimicrobial therapy on clinical outcomes associated with Staphylococcus aureus bacteremia

2. Describe the potential impact of mecA gene testing on timely adjustment of antimicrobial agents for Staphylococcus aureus bacteremia

Self Assessment Questions:

The presence of the mecA gene in a culture of Staphylococcus aureus means the organism is:
a. Sensitive to methicillin
b. Sensitive to all beta-lactam antibiotics
c. Resistant to methicillin and all beta-lactam antibiotics
d. None of the above

Vancomyin is more effective than beta-lactam antibiotics in the treatment of methicillin-sensitive staphylococcal bacteremia?
a. True
b. False

PHARMACOKINETICS OF ONCE DAILY TOBRAMYCIN THERAPY FOR TREATMENT OF PULMONARY EXACERBATION IN CYSTIC FIBROSIS

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Objectives: The primary goal of this study was to evaluate the ability of an empiric-dosing regimen of once daily tobramycin to achieve desired levels in cystic fibrosis patients with pulmonary exacerbations. The secondary goals of the study were to evaluate clinical response, renal toxicity, and patient satisfaction with once daily tobramycin administration.

Rationale: Based on published literature, once daily tobramycin dosing in cystic fibrosis patients with pulmonary exacerbations is a viable treatment option that appears as effective as and potentially less toxic than conventional dosing. By using once daily dosing, the amount of time spent by the patient, nurse, and pharmacist in preparing and administering the medication may be reduced. This may, in turn, reduce the cost of treatment as well as improve patient satisfaction with therapy and quality of life.

Methods: This was an open label study. Participants enrolled in the study received intravenous tobramycin at a dose of 10 mg/kg/dose infused over a minimum of 60 minutes. Treatment lasted 7 to 21 days depending on individual response. Tobramycin serum peak levels were drawn 60 minutes after the end of the first or second infusion. Random levels were drawn 4-6 hours later. Levels were repeated weekly or earlier if clinical conditions dictated. Desired levels were calculated peaks of 20-30 mg/dL and troughs that were undetectable (<0.2 mg/dL). Tobramycin dosing was adjusted based on extrapolated serum levels. Serum creatinine levels were drawn concurrently with either serum peak or random tobramycin level. Investigators interviewed each participant at the initial clinic visit and at the completion of intravenous antibiotic treatment to complete the data collection form. Investigators also administered a patient/caregiver satisfaction survey comparing once daily to three times daily tobramycin therapy.

Results of this study will be analyzed and presented at the Great Lakes Conference.

Learning Objectives:

List the benefits of once daily tobramycin therapy for the treatment of pulmonary exacerbation in cystic fibrosis.

Define the optimal serum tobramycin peak and trough concentrations for the treatment of pulmonary exacerbation in cystic fibrosis when using once daily dosing.

Self Assessment Questions:

One potential benefit of once daily tobramycin therapy compared to traditional dosing for the treatment of pulmonary exacerbation in cystic fibrosis is an increase in patient satisfaction with medication therapy.
1. True
2. False

When using once daily dosing, what is the desired tobramycin serum peak level for the treatment of pulmonary exacerbation in cystic fibrosis?
1. 5-15 mg/dL
2. 20-30 mg/dL
3. 40-50 mg/dL
4. 60-90 mg/dL

SIGNIFICANCE AND IMPLICATIONS OF ANTIBIOTIC USE DURATION IN THE TREATMENT OF NOSOCOMIAL PNEUMONIA IN THE INTENSIVE CARE UNIT

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Abstract:

The optimal duration of antibacterial treatment for many infectious indications is largely unknown. Expert recommendations, in the absence of prospective randomized controlled studies, suggest a treatment duration of 14-21 days for the treatment of ventilator-associated pneumonia (VAP). In theory, there is a risk of infection relapse after a shorter duration of antibiotic therapy. However, this concern should be balanced against the growing problem of emergence of multi-drug resistant microorganisms, particularly with a lack of antibiotics in research and development.

Recently, studies have been published re-examining the duration of antibiotic use in the treatment of ventilator-associated pneumonia. The purpose of this retrospective chart review is to describe the current antibiotic use and practices in the intensive care units (ICUs) at Methodist Hospital in the treatment of nosocomial pneumonia, specifically evaluating antibiotic duration practices, and to assess outcome differences, such as the emergence of multi-drug resistant (MDR) microorganisms, ICU length of stay, and mortality.

Study Methods:

The study will be a retrospective descriptive analysis of medical records.
Data will be collected using patients admitted to the Methodist Hospital ICU from October 2004 through December 2004. Study subjects will be identified using a computer-generated list by the infection control department at Methodist Hospital. Patients will be included if admitted to the Methodist Hospital ICU during the study duration, with a confirmed diagnosis of nosocomial pneumonia and between the ages of 18-89 years of age. Medical records of patients meeting study criteria will be reviewed to determine antibiotic duration, emergence of multi-drug resistant microorganisms, ICU length of stay and mortality.

Results: Pending

Learning Objectives:

1. List the three most common pathogens in nosocomial pneumonia.

2. List recommended antimicrobial therapy in the empiric treatment of nosocomial pneumonia.

Self Assessment Questions:

1. True or False: The most common pathogen in nosocomial pneumonia is MRSA

2. True or False: The duration of hospitalization affects the distribution of microorganism colonization.

IMPLEMENTATION OF AN AUTOMATIC INTERCHANGE FROM IV ONDANSETRON TO IV PROCHLORPERAZINE

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Background:
Agents commonly used at Rush University Medical Center (RUMC) for nausea and vomiting are ondansetron and prochlorperazine. The primary objective of this research project is to encourage the use of prochlorperazine instead of ondansetron on the adult general medicine and surgery services through education of the nursing staff and housestaff, implementation of automatic interchange between IV ondansetron to IV prochlorperazine, and use of automated drug delivery systems (Pyxis). A secondary objective is to monitor the safety of the use of prochlorperazine.
Methods:
Education for pharmacists, nurses and physicians was implemented in the form of e-mails, informational posters and inservices. The Pharmacy and Therapeutics and Medical Executive Committees have also approved the proposal that all ondansetron IV prn orders be changed to prochlorperazine IV prn for select populations of adult medical and surgical patients. Pharmacists will review the patient profile for prior use of prochlorperazine and will not interchange the order if the patient has received an order for prochlorperazine previously or has a documented phenothiazine allergy. This interchange will not apply to post-op or oncology patients. For orders where the automatic interchange is indicated, physicians have the authority to override the interchange. Injectable prochlorperazine will be added to the Pyxis machines on these units for easy access to the drug.
The effectiveness of this project will be measured by analysis of cost and inventory databases and by nursing and housestaff surveys. Reports on the quarterly pharmacy purchasing expenditure will be analyzed for change in purchased quantities of ondansetron and prochlorperazine.
Results:
Between July 1, 2004 and November 30, 2004, 76 orders of prochlorperazine compared to 3,387 orders of ondansetron were removed from the Pyxis machines on the targeted units. Data will be collected through the end of April.

Learning Objectives:

Understand the role of ondansetron versus prochlorperazine in the treatment of nausea and vomiting.

Describe the effects of education and the implementation of an automatic interchange on the prescribing pattern of antiemetics at Rush University Medical Center.

Self Assessment Questions:

True or false: Ondansetron only has FDA indications for the treatment of chemotherapy induced nausea and vomiting (CINV) and post-operative nausea and vomiting (PONV).

True or false: Prochlorperazine's mechanism of action involves antagonizing serotonin receptors.

A RETROSPECTIVE COMPARISON OF EFFECTIVENSS AND TOLERABILITY IN PATIENTS SWITCHED FROM ROFECOXIB TO ETODOLAC IN THE MANAGEMENT OF PAIN

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With the withdrawal of rofecoxib from the worldwide market in September 2004, patients at the William S. Middleton VA Memorial Hospital required another suitable analgesic demonstrating equal efficacy, but minimal and tolerable side effects. This retrospective chart review will seek to determine if etodolac will provide sufficient pain relief, while minimizing adverse events when compared to rofecoxib. Although less commonly used in practice due to the availability of other newer pharmacological agents, etodolac was selected as the agent for this switch due to literature supporting its minimal gastrointestinal profile when compared to other non-steroidal anti-inflammatory drugs. Study participants included all who were previously taking rofecoxib prior to market withdrawal, including those taking warfarin concurrently. Patients were routinely followed by their prescribing health care provider(s) after the mandatory switch was made up until February 2005, unless symptoms warranted earlier intervention than routine follow-up. Tolerability will be measured by evaluating the number of participants who discontinue etodolac, the average length of etodolac therapy, relevant addition or increased titration of H2 antagonist or proton pump inhibitors (PPIs), and verbal complaints of any adverse effects including GI discomfort/GI hemorrhage/physical functionality that the participants believes to be related to etodolac. Effectiveness will be assessed by noting any changes in pain using a numerical pain scale. Vitals and routine lab data including blood pressure readings, serum creatinine, hematocrit, platelets, and hemoglobin will also be assessed if available. Medication refill history will aid in assessing compliance. Summary of results and any conclusions are pending. Positive findings in this study may prove beneficial for other institutions interested in making similar therapeutic substitutions.

Learning Objectives:

1. Summarize and compare differences in pain relief and treatment outcomes with rofecoxib and etodolac.

2. Identify factor(s) influencing discontinuation of etodolac therapy and switch to another analgesic agent.

Self Assessment Questions:

1. Etodolac (Lodine®) was selected by the Medical Advisory Panel and pharmacy Benefits management group (PBM) as the agent for the switch from rofecoxib for the following reason(s):
a. Literature supporting minimal gastrointestinal side effect profile
b. Superior efficacy compared to selective COX-2 inhibitors in several randomized controlled trials
c. Higher COX-2/Cox-1 ratio
d. A and B
e. None of the above

2. Please Assess the following statement by circling: True or False?

More than 25% of study participants failed therapy by discontinuing etodolac due to adverse side effects.

DRUG SAMPLE UTILIZATION AND THE EFFECT ON CONSISTENT DRUG THERAPY IN AN INDIGENT CARE SETTING

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The use of drug samples has become a common way of providing drug therapy for the indigent population. However, it is a concern that this provision is usually temporary and may lead to inconsistent therapy. The purpose of this study is to examine the continuity and consistency of drug therapy after drug samples have been dispensed in an indigent, ambulatory care setting. Patterns of drug sample usage will also be evaluated.

A retrospective study will be conducted in an indigent, ambulatory care setting at two of the five health centers within the Columbus Neighborhood Health Center (CNHC), Inc. Adult patients identified from drug sample log sign out sheets, who had been given a drug sample within a six month period (January 1, 2004 to June 30, 2004), will be randomly selected to be included in the study. Using the drug sample sign out sheets, the health center's internal database system, patient medication assistance reports, patient charts, and prescription benefit manager reports, data will be collected regarding: patient demographics, prescription coverage, and reason for drug sample use along with drug sample regimen, period of use, and therapeutic use. Data will also be collected regarding subsequent drug therapy and its period of use up to six months after sample use. The descriptions of drug sample utilization and lengths of gaps in therapy, if applicable, will be analyzed to evaluate the ways samples are used in an indigent care setting and the effect of sample use on the continuity and consistency of drug therapy.

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

Learning Objectives:

To determine the effect of drug sample use on the continuity of drug therapy.

To describe the reasons drug samples are utilized in an indigent, ambulatory care setting.

Self Assessment Questions:

What are some common ways drug samples are used in an indigent, ambulatory care setting?

Drug sample utilization in an indigent, ambulatory care setting may often lead to interruptions in chronic drug therapy: True or False

THE USE OF MEMANTINE WITH CHOLINESTERASE INHIBITORS IN DEMENTIA PATIENTS

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Approximately 4.5 million persons in the United States have been diagnosed with Alzheimer's disease (AD), a progressive neurodegenerative disorder characterized by cognitive decline, memory deterioration, impaired performance of activities of daily living (ADLs), behavioral disturbances, and neuropsychiatric symptoms. Historically acetylcholinesterase inhibitors (AChEIs) were the only pharmacologic agents available for the treatment of AD. In October 2003, the FDA approved memantine for use in patients with moderate-severe AD. Memantine has only been studied in combination with one AChEI, donepezil. It remains unknown if differences in safety and efficacy exist when used with other AChEIs. Lack of strong evidence of clinical significance and high cost necessitate a closer look at the efficacy and significance in the treatment of dementia. The purpose of this study is to determine the clinical significance of memantine use and determine differences in tolerability or efficacy when used alone or in combination with the different AChEIs.

This study will be a retrospective chart review of all patients at the Jesse Brown Veterans Affairs Medical Center who received a prescription for memantine between January 1, 2004 and December 31, 2004. The following data will be collected from the electronic medical record: gender, age, creatinine clearance, dementia type, cause of dementia, underlying conditions, memantine initiation date, reasons for discontinuation, weight, adverse effects, concurrent use of AChEIs, Mini Mental Status Exam (MMSE) and Blessed Orientation-Memory-Concentration (BOMC) scores at baseline and three-month increments. Primary endpoints will include change in MMSE and BOMC scores. Secondary endpoints will include body weight, changes in activities of daily living, and difference in efficacy of memantine in combination with different AChEIs.

Learning Objectives:

Understand the mechanism of action of memantine and how it differs from acetylcholinesterase inhibitors.

Expand knowledge of the use of memantine as monotherapy or in combination with different acetylcholinesterase inhibitors.

Self Assessment Questions:

True or false: The safety profile of memantine is similar to placebo.

True or false: Memantine provides only symptomatic treatment for moderate-severe AD.

THE RISK OF DEVELOPING DIABETES IN PATIENTS TREATED WITH QUETIAPINE COMPARED TO OLANZAPINE

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Introduction: Recent literature suggests that certain atypical antipsychotics may increase the risk of developing type 2 diabetes. There are no studies that directly compare the risk of developing diabetes in patients treated with quetiapine and the other atypical antipsychotics that have been shown to increase the risk of diabetes. The objective of this study is to examine the risk of developing diabetes mellitus in patients being treated with quetiapine compared to patients being treated with olanzapine.

Methodology: The Cincinnati VAMC medical record system will be used to determine the number of patient that were treated with any dose of quetiapine or olanzapine over a one year period. Data will be collected from patients at least 18 years of age and who received treatment with quetiapine or olanzapine for at least a two-month period between October 1st 2002 and September 30th 2003. Subjects will be excluded if they had diagnosis of diabetes prior to initiation of quetiapine or olanzapine, if they have been treated with an antipsychotic medication within the past year, if they are using quetiapine or olanzapine on an as needed basis, or if they are being treated with more than one antipsychotic medication. Each subject's chart will be reviewed for a new diagnosis of diabetes during treatment with quetiapine or olanzapine. A diagnosis of diabetes will be identified through review of prescriptions for any medication indicated for the treatment of diabetes, including insulin; documentation of a diagnosis in any inpatient or outpatient progress note; or hospital admissions for ketoacidosis. Statistical analysis for this study will include a X2 analysis of the difference between the risks associated with developing diabetes in patients treated with quetiapine compared to patients treated with olanzapine. A power analysis will be done to determine the power of the study.

Results: Data is currently being collected.

Learning Objectives:

Review the risk of developing diabetes mellitus associated with olanzapine, risperidone, clozapine, and the typical antipsychotics.

From the results, identify the risk of developing diabetes mellitus in patients being treated with quetiapine compared to patients being treated with olanzapine.

Self Assessment Questions:

True or False. Olanzapine is associated with an increased risk of developing diabetes compared with risperidone.

True or False. Quetiapine is an atypical antipsychotic agent that is structurally similar to olanzapine and clozapine.

DETERMINING THE ROLE OF PHARMACISTS IN THE EDUCATION OF MEDICAL RESIDENTS: A PILOT IN ONCOLOGY.

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Purpose

The education of medical residents regarding drug therapy guidelines and appropriate prescribing practice is often inadequate. Pharmacists have a wealth of knowledge regarding appropriate medication use that is typically underutilized. The objective of this project is to implement a pharmacist-taught educational series and evaluate the impact of the program in the education of medical residents.

Methods

Needs assessment and satisfaction surveys have been distributed to hospital house staff and used to determine medical residents' perception of the need for medication education and satisfaction of current pharmacist involvement. An education series has been initiated that consists of four pharmacist-taught sessions, with one session taught weekly. Additionally, pharmacist intervention audits have been and will continue to be conducted on the medication orders to asses the impact of pharmacist-taught education.

Preliminary Results

Sixty percent of those responding to the needs assessment and satisfaction surveys indicated that there is a need for house staff to receive more training regarding overall medication use. Pharmacists were chosen most often among responders to be the practioner best able to provide education regarding medication use. The vast majority of medical residents indicated that they are satisfied with the current involvement of pharmacists and that pharmacists contribute meaningfully to patient care. Results from the intervention audits are pending and will be presented at the conference.

Conclusions will be presented at the conference.

Learning Objectives:

Identify three factors that contribute to the need for additional medication-related education for medical residents.

Describe the potential for pharmacist involvement in the education of medical residents.

Self Assessment Questions:

What was the purpose of the needs assessment and satisfaction survey that was distributed to hospital house staff?

How did the pharmacist-taught education series affect the intervention audits?

EVALUATING THE USE OF COLONY STIMULATING FACTORS (CSFS) AND DEVELOPING UPDATED GUIDELINES

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Background: Neutropenia is a common chemotherapy-induced toxicity, which can lead to delays in treatment cycles or reductions in chemotherapy dosage thereby potentially compromise treatment efficacy in cancer patients. As an attempt to prevent the development of neutropenia, colony stimulating factors (CSFs) have been utilized in certain chemotherapy regimens. To ensure appropriate use of these agents, Evanston Northwestern Healthcare (ENH) developed institutional guidelines based on those from American Society of Clinical Oncology (ASCO). The purpose of this project is to evaluate CSFs usage patterns at ENH and update the current institutional guidelines to include pegfilgrastim (Neulasta). Compliance with the revised guidelines will also be examined.

Methods: An initial literature search was performed and a five-question survey was sent to other oncology centers to assess current use of CSFs. A retrospective chart review was conducted for all patients who received either filgrastim (Neupogen) or pegfilgrastim between December 2003 and December 2004 to assess institutional compliance with the current guidelines. Non-hematology/oncology patients and patients who received CSFs at home were excluded from the study. Based on the results, current guidelines will be revised and implemented at ENH. As a follow up, compliance with the revised CSF guidelines will be assessed.

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

Learning Objectives:

To learn the risk factors for chemotherapy-induced neutropenia.

To understand the proper use of CSFs.

Self Assessment Questions:

According to the ACSO guidelines, CSFs should be recommended instead of chemotherapy dose-reduction in subsequent cycles for patients who have had neutropenia after one or more cycles of combination chemotherapy T or F

Pegfilgrastim is as safe and effective as filgrastim in reducing frequency and duration of severe neutropenia T or F

IMPLEMENTATION OF ANEMIA TREATMENT GUIDELINES: A CONVERSION TO EPOETIN ALFA AS THE SOLE ERYTHROPOIETIC GROWTH FACTOR

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Anemia frequently occurs in chronic conditions, primarily chronic kidney disease and cancer. The primary cause of anemia in CKD patients is the failure of the kidneys to produce an adequate amount of erythropoietin. The primary cause of anemia of cancer relates to the use of chemotherapy and its ability to impair erythropoietin production. Subsequently, both types of patients often need replacement of this erythropoietin to prevent further complications of anemia. There is a lack of studies evaluating the conversion from darbepoetin alfa to epoetin alfa. Mount Carmel Health System has decided to change from carrying both products to only carrying epoetin alfa. Therefore, an anemia guideline and darbepoetin alfa to epoetin alfa dose conversion chart are needed in order to carry out this formulary change in the Mount Carmel Health System.

The primary objective is to evaluate if the implementation of an anemia guideline will improve the outcomes such as hemoglobin and hematocrit during dosing of epoetin alfa. A secondary objective is to evaluate any cost savings through the switch to carrying only epoetin alfa versus carrying epoetin alfa and darbepoetin alfa.

A baseline retrospective Medication Use Evaluation (MUE) will be performed at Mount Carmel West over a 3 month time period to assess the usage of epoetin alfa and darbepoetin alfa in the outpatient setting. After the baseline MUE has been performed guidelines for the treatment of anemia due to chronic renal failure patients and chemotherapy will be implemented. At 3 months post implementation of the guidelines, a retrospective MUE at Mount Carmel West will be performed to evaluate the outcomes of using the guideline

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

Learning Objectives:

Discuss the rationale for using erythropoietic growth factors in the treatment of anemia do to chronic conditions.

Describe the purpose of treatment guidelines and how they can effect overall patient outcomes.

Self Assessment Questions:

Erythropoietic growth factors can be used in the treatment of patients with anemia that has developed from chronic conditions such as chronic kidney disease or cancer. T/F

Treatment guidelines should be followed very strictly and a patient specific case should never fall outside the guidelines. T/F

PHARMACISTS' ROLE IN DISCHARGE TEACHING IN A PEDIATRIC HOSPITAL

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The purpose of this project is to evaluate the impact of a pharmacist on medication discharge teaching in a pediatric institution. The focus is to decrease medication errors, improve patient safety, and establish a pharmacy medication discharge teaching service.

This evaluation is a concurrent monitor of hospitalized pediatric patients who are being discharged from the hospital on three or more medications. Following a pharmacy consultation request, a medication calendar is prepared. Each calendar documents the brand and generic names of the medication, the concentration of the medication, the dose in both milligrams and milliliters when appropriate, the directions for use, and daily administration times. The home pharmacy is contacted to verify dose and compounding formulas. Medication information and calendar are discussed with the family or caregiver's of the patient. Data regarding patient information, calendar preparation, and medication teaching are recorded on a pharmacy consultation evaluation form, and descriptive statistical analysis is performed.

Preliminary results are reported from 12 completed discharges. On average, there were 7.5 medications on each patient specific medication calendar. The average total time spent on background information gathering and calendar preparation was 81.7 minutes with an average of 7 interventions, corrections, or clarifications performed in regards to missing medications, dosing discrepancies, medication timing, or medication formula clarification. The average total time spent with caregivers in the medication teaching process was 27.5 minutes with an average of 2.2 interventions performed during the teaching process. The average total time spent on the patient specific discharge process was 109.2 minutes and there were 9.2 interventions, clarifications, or corrections per discharged patient.

Results to this point demonstrate the positive impact that pharmacy driven discharge teaching services have in a pediatric institution with regard to preventing medication errors and developing a new pharmacy service.

Learning Objectives:

To be able understand potential sources of error in the discharge process from a pediatric hospital.

To be able to understand potential safety concerns in the discharge process from a pediatric hospital.

Self Assessment Questions:

List three potential errors pediatric pharmacists can prevent in the discharge process.

List two potential safety concerns in the discharge process from a pediatric institution.

USE OF ANTIDEPRESSANTS IN HEART FAILURE

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Background / Objectives: Heart failure (HF) and major depressive disorder (MDD) are prevalent illnesses that often coexist in the same patients. Patients diagnosed with MDD are at an increased risk of developing cardiovascular disease and tend to have poorer outcomes following a cardiovascular event. Recent studies have demonstrated that HF and MDD are characterized by similar physiological changes, suggesting that the two diseases may share a common pathophysiology. It has been hypothesized that the use of antidepressants could potentially improve HF outcomes by possibly reversing physiological and behavioral aspects of MDD that influence HF progression. Small clinical trials have evaluated antidepressant use in HF patients and have shown beneficial effects.

The primary objective of this study is to evaluate demographic, health status, outcome, and treatment differences between presumed non-depressed (not on antidepressant) and presumed depressed (on antidepressant) patients admitted to the HF service. The appropriateness of antidepressant selection, potential drug-drug interactions, and QT-prolongation will also be evaluated.

Methods: This study is a retrospective chart review of patients admitted to the HF service from 7/1/03 to 6/30/04. The patient population included HF patients > 18 years old with a left ventricular ejection fraction (LVEF) < 40%. Data collection included age, sex, LVEF, New York Heart Association classification, number of cardio- and non-cardio-related hospital readmissions, co-morbid disease states, HF medications prescribed at discharge, and use of antidepressant medications. Patients were separated into two groups (HF and HF + antidepressant) for comparison of health status, readmissions, and hospital mortality. Antidepressant selection was evaluated by comparing the types of antidepressants prescribed prior to admission against those prescribed at discharge, drug-drug interactions, QT-prolongation, and adherence to evidence-based medicine in antidepressant selection.

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

Learning Objectives:

Become familiar with the proposed behavioral and physiological mechanisms of interaction existing between depression and cardiovascular disease.

Describe the best treatment option(s) available for depression in patients with coexisting heart failure.

Self Assessment Questions:

Depression and cardiovascular disease share the following physiological changes in common:
a. Increase in plasma proinflammatory cytokines
b. Decreased sympathetic activity
c. Increased platelet activation
d. Increased in plasma cortisol
e. A and C
f. B, C, and D
g. A, C, and D
h. All of the above

T or F Sertraline is the ONLY antidepressant that has been evaluated for safety and efficacy for the treatment of depression in heart failure patients.

IN VITRO EFFECT OF VARIOUS ANTIFUNGAL COMBINATIONS AGAINST CRYPTOCOCCUS NEOFORMANS

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Background: Infections caused by Cryptococcus neoformans, particularly cryptococcal meningitis, remain a significant source of morbidity and mortality in immunocompromised patients despite recent advances in antifungal therapy. Cryptococcal infections present a unique challenge to therapy since the recommended treatment, amphotericin B with flucytosine, is still associated with clinical failure. One area of particular attention is the use of combination antifungal therapy. With the advent of antifungals such as voriconazole and caspofungin, it is possible that newer combinations may prove to be efficacious. The aim of this study is to utilize in vitro techniques to screen the potential of various combinations of antifungals against C. neoformans.

Methods: Antifungals that will be included in combination testing include fluconazole, voriconazole, caspofungin, and amphotericin B. Antifungal combinations will be tested against clinical isolates of C. neoformans with variable fluconazole susceptibility. NCCLS guidelines will be utilized to determine the minimum inhibitory concentrations (MICs) of the various antifungals against the cryptococcal isolates. Time-kill experiments will be performed to determine whether combination antifungals are superior to monotherapy. Antifungal combinations will be defined as enhanced, additive, indifferent, or antagonistic in their actions towards C. neoformans. Target drug concentrations in time-kill experiments will include the MIC and clinically relevant concentrations. Clinically relevant drug concentrations will be based upon those concentrations that can safely be achieved in vivo. Colony enumeration will be accomplished via a novel quantitative, real-time polymerase chain reaction (PCR).

Results/Conclusions: Research is currently in progress. Results will be presented when data collection and analysis are complete.

Learning Objectives:

To review pharmacodynamic interactions of antifungals against Cryptococcus neoformans.

To evaluate the potential antifungal combinations against Cryptococcus neoformans.

Self Assessment Questions:

What is the evidence for the use of combination antifungals in Cryptococcus neoformans?

What are some of the problems with assessment of antifungal pharmacodynamics?

THE PREVALENCE OF ATRIAL FIBRILLATION IN HEART FAILURE IN DIFFERENT RACES

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Purpose:
Heart Failure (HF) affects more than 5 million people and atrial fibrillation (AF) affects more than 2 million people in the United States. An estimated 15% to 30% of patients with HF also have AF. Data is conflicting as to whether HF predisposes a patient to AF. The prevalence of AF in HF for different races has not been studied in depth. A recent study found the incidence of AF in HF is higher in Caucasians (38.3%) than in African Americans (19.7%). However, 84% of the study population was Caucasian. Another published abstract also reached the same conclusion. In order to further establish race as a possible risk factor for the development of AF in HF, we conducted examined the incidence of AF in HF in patients seen at the University of Illinois Medical Center (UIMC) HF Clinic as the clinic has an 80% African American population. We also examined demographic and clinical characteristics for their association with racial differences in AF incidence. The primary objective was to determine if race is associated with the prevalence of AF in HF. A secondary objective was to identify contributing factors to the racial disparity of AF in HF.

Methods:
The medical records from all patients followed in the UIMC HF Clinic will be examined. Patients with a history or current diagnosis of AF will be included for data collection. Data will be collected in a retrospective manner and included: patient demographics, co-morbid conditions, laboratory values, echocardiogram results, and medications. Patients who were seen by a clinician in the Heart Failure Clinic at the UIMC on only one occurrence or had a history of cardiac transplant were excluded. Race will be based on the patient's self-determination of race as listed in the medical record.

Results: Data collection in progress.

Learning Objectives:

List risk factors for Atrial Fibrillation in patients with Heart Failure.

Summarize articles that relate atrial fibrillation to heart failure.

Self Assessment Questions:

What are some of the possible mechanisms that put a patient with heart failure at risk for developing atrial fibrillation?

What does recent data show in regards to racial differences in atrial fibrillation in patients with heart failure?

INITIATING JCAHO 2005 HOSPITALS' NATIONAL PATIENT SAFETY GOALS

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Purpose: The aim of this project is to comply with the Joint Commission's 2005 National Patient Safety Goals by developing and assessing the usefulness of a process for pharmacy personnel to educate patients about changes in medication therapy and inform other health care professionals involved with the personal care of individual patients.

Methods: A general letter was constructed for health care professionals (HCPs) stating that their patient was recently discharged from Wishard Health Services (WHS). This letter also informed the HCP of the current project, instructions, and appreciation of time involved. Next, a prepaid and self addressed post card was created asking the HCP to answer several questions including: in which institution do you practice, what is your profession, is your institution affiliated with WHS, do you find the information provided in this letter useful for improving patient care? Finally, Pharm.D. Candidates or a pharmacy practice resident counseled the patients admitted to WHS medicine services about the changes in medication therapy made during the hospital course. During the counseling session, a list of current medications, the general letter to the HCP, and the post card were all placed in an envelope and handed to the patient. It was then the patient's responsibility to deliver this to the next HCP with whom they come in contact. The return of this post card to the department of pharmacy confirmed that HCPs received the information.

Results: Data are currently being collected. The information will be analyzed to gain knowledge regarding the number of patients using facilities not located within the WHS domain, which HCPs are most frequently the first contact for the patient, and the value of the information provided.

Learning Objectives:

Identify the importance of creating a continuum of patient care.

Identify the process associated with creating a new system to educate patients about medication therapy, and assess if the next health care provider receives that information.

Self Assessment Questions:

True or False Providing a continuum of patient care opens the lines of communication and promotes the safe practice of medicine.

True or False This process is mandated by the JCAHO 2005 National Patient Safety Goals.

SAFETY OF STATIN USE IN PATIENTS WITH LIVER DISEASE: A RETROSPECTIVE ANALYSIS.

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Background: HMG-CoA-reductase enzyme inhibitors, also known as statins, have been proven to play a role in primary and secondary prevention of cardiovascular events in diseases such as diabetes mellitus, coronary artery disease, and hyperlipidemia. The presence of liver disease such as hepatitis C and non-alcoholic fatty liver disease (NAFLD) can complicate the selection of lipid lowering therapy. Manufacturers recommend that statins should be used in caution in patients with history of liver disease. They also state statins are contraindicated in patients with active liver disease or unexplained elevation of transaminases. Multiple clinical trials have shown minimal elevations of liver function tests (LFTs) in patients with normal liver function prior to statin therapy. These trials have also shown that statin-induced hepatotoxicity is rare. Only one clinical trial evaluated the safety of statin use in patients with elevated LFTs. It concluded that increases in LFTs while on a statin were minimal and non-significant. This study was the first to evaluate statin use in a patient population in which statin use is traditionally contraindicated. However, hepatitis C and NAFLD patient were not incorporated into the study. Therefore, the objective of this study is to investigate the safety of statin use in patients with liver disease such as hepatitis C and NAFLD in a veteran population.

Methods: A single center, retrospective study of 500 patients who have been prescribed statins from June 2002 to May 2004 and diagnosed with liver disease (hepatitis C or non-alcoholic fatty liver disease). Retrospective medical chart review will be conducted. Data collected includes: demographics, lipid profile, liver function tests, serum creatinine, medication profile, past medical history, concomitant disease states, adverse events, drug therapy for cholesterol management, discontinuation of therapy, and compliance. Results will be analyzed and presented to the Great Lake Conference.

Results/Conclusion: Pending

Learning Objectives:

To determine the effect of statins on liver function in patients with liver disease who are receiving statins.

To identify the limitation of statin use in patients with hepatitis C or non-alcoholic fatty liver disease.

Self Assessment Questions:

True or False: In patients with liver disease, statin therapy should be used in caution.

True or False: Not all patients with liver disease will present with elevated liver function tests.

PHARMACIST INVOLVEMENT IN A DISEASE MANAGEMENT PROGRAM IN AN OUTPATIENT CLINIC.

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The purpose of this project is to implement a program involving pharmacists and disease management. Evidence supports pharmacist involvement in such programs to improve overall patient healthcare by decreasing ER and physician office visits and improving patient compliance to therapy through education and medication management.

The primary method is to design a proposal for a pharmacist’s involvement with disease management in an outpatient clinic. Focused parameters for this proposal will include the following: present and future reimbursement for pharmacists, pharmacist scheduling in the clinic, utilization of collaborative care agreements and justification of a pharmacist position in a clinic.

The results will likely confirm the need and value of pharmacists in disease management programs. This study’s yielding proposal will be presented to the clinic administration to determine feasibility and likelihood of an appointed pharmacist position in an outpatient clinic.

Upon conclusion of this project, the proposal will be accepted or denied. An accepted proposal will yield a pharmacist position in an outpatient clinic for the purposes of disease management and improving patient healthcare.

Learning Objectives:

Be able to discuss present and future reimbursement for pharmacists involved in disease management programs.

Be able to discuss a sample proposal for implementing a pharmacist involved disease management program.

Self Assessment Questions:

Pharmacists are currently approved providers under Medicare. T or F

Pharmacists’ involvement in disease management programs is of benefit to the patient. T or F

CLINICAL, OPERATIONAL, AND FINANCIAL EVALUATION OF AN IV ROBOTIC TECHNOLOGY

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Introduction:
Many efforts are being made to improve patient safety by reducing medication errors. The use of technology is one way in which this may be done. Technology has the potential to significantly improve patient safety and quality of care. Much work is needed to evaluate the impact of these technologies. The adoption of new technology will be facilitated if there is a clear return on investment (ROI). IntelliFill i.v. is the first robotic technology designed to produce patient-specific small-volume i.v. medications. This technology automates the compounding, loading, and labeling of intravenous (IV) syringes.

Purpose:
The intent of this study is to determine the ROI of an IV robotic technology by utilizing a three-part analysis to evaluate the impact on medication safety, operational changes, and financial returns.

Methodology:
This is a pre and post implementation observational study design using a three-part analysis of identifying and assessing ROI in healthcare technology. The first component is the clinical analysis which entails evaluating medication safety. A two-week pre and post implementation direct observational study of medication preparation in the IV admixture area will be conducted. The second component is an operational analysis of process improvements, workflow changes, and redeployment of staff. A staff satisfaction survey was conducted pre and post implementation of the IV robotic technology. The third component is the financial evaluation of all costs associated with the preparation and dispensing of IV medications.

Results: Data analysis in progress.

Learning Objectives:

Describe three methods of assessing return on investment of healthcare technology.

To understand the potential clinical, operational, and economic impact of implementing an IV robotic technology.

Self Assessment Questions:

List three methods in which to evaluate return on investment of healthcare technology.

True/False: IntelliFill i.v. is the first robot designed to produce patient specific small volume IV medications.

IMPLEMENTATION AND EVALUATION OF A PHARMACIST INITIATED RENAL FUNCTION-BASED MEDICATION DOSING PROTOCOL

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Renal insufficiency occurs in over 5% of hospital inpatients, placing them at increased risk for morbidity and mortality. Renal dysfunction can have a significant effect on the medication pharmacokinetics including changes in absorption, distribution, metabolism and excretion. Medications primarily eliminated renally often require dosage adjustment in the presence of renal dysfunction. Costs can be decreased by individualizing doses based on renal function either by decreasing the dose or frequency of doses, and avoiding toxic reactions due to inappropriate doses. At The University Hospital there is no direct link between the pharmacy order-entry system and the laboratory computer to screen for potentially inappropriate doses based on renal function. Due to staffing limitations there are medical teams that do not have a pharmacist on their service. Pharmacists could more efficiently aid in the dosage of patients with renal dysfunction if prescribers did not have to be contacted prior to a dosage change.

The purpose of this study was to evaluate the effect of a pharmacist initiated dose adjustment protocol on the cost of medication therapy.

A list of medications and dosage recommendations were developed and approved by the Pharmacy and Therapeutics Committee. Medications on this list were approved for pharmacists to adjust dosages based on renal function estimated by the Cockroft and Gault equation. To identify patients with renal dysfunction, the laboratory provided a daily report to the pharmacy of each inpatient that had a serum creatinine concentration > 1.4 mg/dL in the previous 24 hours. Pharmacists adjusted dosages and documented interventions in a password-protected database; this data was used to perform a retrospective chart review.

Results and conclusions will be presented at the conference.

Learning Objectives:

Be able to discuss the impact of renal insufficiency on medication dosing

Identify the impact of medication dose adjustment in renal insufficiency on medication costs

Self Assessment Questions:

True or False:
A rapidly changing serum creatinine is an accurate measure of a patient's renal function

Renal insufficiency can have an effect on the ___ of mediations:
a. Absorption
b. Distribution
c. Metabolism
d. Excretion
e. All of the above

A COMMUNITY PHARMACY BASED FITNESS, NUTRITION, AND WEIGHT MANAGEMENT PROGRAM

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Background/Purpose: Obesity has become a leading health concern in the United States, with an estimated 129 million adults classified as overweight or obese, including 65% of adults over the age of 20. Obesity has been closely associated with increased morbidity and mortality, as well as defined as a significant health care cost. Studies have shown that increased activity and weight loss, even if moderate, can actually reverse many of the disease processes associated with obesity. However, the literature has also shown that healthcare professionals are not counseling patients on these necessary lifestyle modifications. The purpose of this project is to develop an innovative patient care service to be implemented in a community pharmacy. This is a pilot program to determine if pharmacist intervention in the community setting can help patients define and attain individualized fitness, nutrition, and weight loss goals while monitoring for medical outcomes.
Methods: Enrollment for the program began in January 2005, and is continuous. The initial program will be administered over twelve weeks and involves weekly one-on-one sessions with the pharmacist or dietician, as well as monitoring of weight, body mass index, body fat percentage, blood glucose, lipids, blood pressure, and quality of life. The focus of the program is on teaching patients to make permanent lifestyle changes in the areas of fitness and nutrition. At the end of the twelve weeks, the patient will have the option of either re-enrolling in the program with new goals, or entering the maintenance phase. Patients will be followed to determine permanent lifestyle changes and if results are maintained at one year. There is a fee associated with the program.
Results: Data is currently being collected. Evaluation will consist of percent of patients meeting goals, change from baseline lab values, a patient satisfaction survey, and overall impact of this service.

Learning Objectives:

To determine the effectiveness of an individualized fitness and nutrition program, with a focus on medical outcomes, run in a community pharmacy setting.

To understand the impact overweight and/or obesity has on an array of disease states including diabetes, hypertension, and dyslipidemia.

Self Assessment Questions:

True or False: An obese person must lose a large amount of weight in order to have a positive impact on any concomitant disease states.

According to the NHLBI Obesity Education Initiative, what three therapies should be combined in order to increase likelihood of weight loss in obese or overweight patients?

ANALYSIS OF PHENYTOIN AND VALPROIC ACID LEVELS FOR THE TREATMENT AND PREVENTION OF SEIZURES

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Phenytoin (PHT) and valproic acid (VPA) are commonly used in combination for seizure treatment and prevention. It has been recognized that this combination of therapy often achieves subtherapeutic levels of VPA despite high doses, due to the enzyme inducing properties of PHT. However, little is mentioned in the literature regarding the appropriate starting dose of VPA when combined with PHT. The purpose of this study is to determine the appropriate starting dose of VPA to achieve therapeutic levels for patients receiving PHT concomitantly for seizure treatment and prevention.

A retrospective chart review is being conducted including patient admissions between January 1, 2000 and June 1, 2004 at The Ohio State University Medical Center. The study will review patients who received PHT and VPA simultaneously upon or during admission for the indication of seizures. Patients are included if they had a documented diagnosis of seizures, concomitantly on PHT and VPA during or upon hospitalization, and if drug levels of both PHT and VPA were drawn during the admission. The exclusion criteria are patients with no drug levels available, PHT levels not within a therapeutic range, prisoners, and patients being switched from one medication to the other. Patients will be divided into those that had seizures and those that did not have seizures during admission, and then subdivided into four major groups based upon the VPA level achieved during admission. The primary outcome of this study is to determine the VPA dose needed to achieve therapeutic VPA levels. The VPA dose will be defined as the total daily dose administered that achieved the highest near steady state or steady state trough VPA level during admission. To date, 192 admissions have been identified, of which 95% have been reviewed. Eighty-three patients have been excluded, leaving 99 admissions representing 61 patients for final analysis.

Learning Objectives:

Understand the impact of phenytoin on serum levels of valproic acid

Identify a reasonable dose of valproic acid necessary to obtain therapeutic levels when concomitantly administered with phenytoin

Self Assessment Questions:

Phenytoin decreases the dose of valproic acid necessary to obtain therapeutic blood levels. T or F

The only mechanism by which phenytoin interacts with valproic acid is by hepatic enzyme induction. T or F

DEVELOPMENT AND IMPLEMENTATION OF AN INPATIENT PHARMACY-MANAGED ANTICOAGULATION CONSULT SERVICE

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Anticoagulation requires appropriate dosing and monitoring to provide safe and effective therapy. Pharmacy-managed anticoagulation services have been proven to benefit the patient, as well as the hospital. These services provide more appropriate dosing resulting in fewer adverse outcomes, shortened hospital length-of-stay, and reaching of therapeutic levels sooner than physician-managed services. Activities of a pharmacist managed anticoagulation service include dosing of unfractionated and low molecular weight heparin, initiating warfarin therapy, ordering appropriate baseline and follow-up labs, and monitoring progress toward therapeutic goal.

The purpose of this project is to develop and implement a pharmacy-managed anticoagulation consult service. Physicians can consult the pharmacy-managed service for patients being treated with unfractionated heparin, low molecular weight heparin, and warfarin. The consult service will be piloted with medical resident physicians. The pilot results will be utilized to determine plans for expansion of the service on a hospital-wide basis.

This is a prospective study with comparison to historical controls. Patients who are being started on anticoagulation therapy and meet the eligibility requirements may be enrolled. Based on those same eligibility requirements, the historical controls will be patients who were treated with warfarin or unfractionated heparin between November 2004 and January 2005. The primary end points for heparin and warfarin therapy are the time elapsed between the initiation of therapy and reaching the first therapeutic PTT (in hours) or INR (in days), respectively.

Data analysis is currently in progress. Results and conclusions will be presented at the Great Lakes Conference.

Learning Objectives:

Discuss the impact of pharmacy monitoring of anticoagulation therapy on surrogate markers of patient outcomes.

Identify steps that need to be taken in implementing a pharmacy based anticoagulation service.

Self Assessment Questions:

It is recommended to stop treatment doses of unfractionated heparin or low molecular weight heparin on the same day a patient reaches a therapeutic INR. True/False

Pharmacy services focused on anticoagulation monitoring can improve patient outcomes. True/False

COMPARATIVE ANALYSIS OF ADVERSE DRUG EVENTS IN A HEALTH SYSTEM

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In the United States, 44,000-98,000 deaths result from ADEs each year according to the Institute of Medicine's report in 1999. It is estimated that 3.7% of patients in hospitals are affected by medication errors. ADEs increase health care costs by increasing the length of hospital stay by an average of 2 days. This results in an increased cost per admission of more than $2000.00. Most importantly, the mortality rate is nearly three times higher in these patients.

Although many studies have been conducted on adverse drug events, few studies compared ADEs of different institutions within a health system. While health care institutions are attempting to develop strategies to prevent ADEs, data supporting applicability of findings from one site to another has been lacking. The purpose of this study is to identify trends in the frequency and severity of adverse drug events and compare sites within the health system. This will allow prioritization of institutional and system-wide preventive strategies for managing ADEs.

The study will retrospectively review data from the computerized online reporting system utilized at the DMC. ADE data from January 2004 to December 2004 are analyzed and categorized into the following types: allergies, compounding errors, dose given after discontinuation, infiltration/extravasation, wrong dose, wrong route, wrong rate, wrong time, wrong patient, wrong drug, omissions, and drug classes. Types and categories of adverse drug events will be identified for trends by each site of the health system. Once identified, trends will be evaluated to determine if they are site specific, or system-wide, in nature. The study will then recommend a prioritized plan for process improvements.

Learning Objectives:

Compare and contrast adverse drug events (ADEs) reported by the seven hospitals of the Detroit Medical Center (DMC) that utilize a shared computerized reporting system.

Determine if there are trends in problematic events that can only be identified through a system-wide review.

Self Assessment Questions:

True or False: It is estimated that 25% of patients in hospitals are affected by medication errors.

True or False: ADEs result in increased costs of more than $2000.00 per event.

GASTRIC ACID SUPPRESSION IN MECHANICALLY VENTILATED PATIENTS: COMPARING LANSOPRAZOLE CONTINUOUS INFUSION VS. INTERMITTENT BOLUS

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Background: Prophylaxis with acid suppressing agents is recommended for patients at high risk of developing stress related mucosal damage (SRMD). Past therapies have included antacids, histamine-2 receptor antagonists (H2RAs), sucralfate, and proton pump inhibitors (PPIs). Pepsin, which is responsible for clot lysis, is inactive at a pH of 4-6 and irreversibly inactivated at a pH > 6. Maintaining intragastric pH ≥ 4 may reduce SRMD and bleeding, and is widely accepted as the targeted pH for preventing and treating upper gastrointestinal bleeding. Intravenous proton pump inhibitors (PPIs) rapidly control gastric acid secretion by inhibiting the hydrogen-potassium adenosine triphosphatase (H+/K+-ATPase or “proton pump”) in the gastric parietal cell. The results of comparative studies have shown PPIs to be more effective than H2RAs for elevating intragastric pH. The superiority of PPIs over H2RAs for peptic ulcer disease and gastroesophageal reflux disease motivates our investigation of PPIs in SRMD prophylaxis.

The primary objective is to measure the gastric pH of mechanically ventilated patients on PPI regimens before treatment, at 12 hours, 24 hours and 48 hours on therapy.

Methods: This study will be a randomized, open-label, controlled trial to determine the pH achieved with lansoprazole IV continuous infusion compared to intermittent bolus. Patients in Group 1 will receive an initial lansoprazole 60 mg intravenous bolus followed by a continuous infusion at 6 mg/hr. Patients in Group 2 will receive a 60 mg intravenous bolus, then 30 mg intravenously twice daily. Gastric acid pH will be tested from gastric fluid aspirated from the nasogastric tube at baseline, 12 hours, 24 hours, and 48 hours after therapy.

Results: Data collection is pending.

Learning Objectives:

Identify patients that are at high risk for developing stress related mucosal damage in the intensive care unit

Describe the therapeutic options for the prevention of SRMD

Self Assessment Questions:

What are the advantages of using a proton pump inhibitor over a histamine-2 receptor blocker?

What is the proposed benefit of maintaining the gastric pH > 4 in prevention of SRMD?

A. Activation of the intrinsic clotting cascade
B. Pepsin inactivation
C. Prolongation of the activated partial thromboplastin time (aPPT)
D. Stabilization of formed clots

CLINICAL AND FINANCIAL OUTCOMES OF A THERAPEUTIC INTERCHANGE PROGRAM FOR ERYTHROPOIETIC GROWTH FACTORS IN ADULT HEMODIALYSIS PATIENTS

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Background/Objectives:
Anemia is a common problem in hemodialysis patients and recombinant erythropoietic proteins are the drugs of choice. Currently these include epoetin and darbepoetin. Data suggesting therapeutic equivalence of these products and the high economic impact that EGFs have on hospital expenses, has led to interest in implementing therapeutic interchange programs. No published studies examining the impact of a therapeutic interchange program in chronic hemodialysis patients exist.

The primary objectives of this study are to determine the clinical impact on Hgb levels and post-discharge epoetin dose requirements after implementation of a darbepoetin for epoetin therapeutic interchange in hospitalized chronic hemodialysis patients, compared to an epoetin-only historical control group. The secondary objective will be to quantify the economic impact of the interchange program from the perspective of the health system.

Methods:
A retrospective review will be conducted. The control group consists of chronic hemodialysis patients treated before the therapeutic interchange program was implemented in the hospital and the interchange group includes patients after implementing the program. The control group data will be obtained from admissions for 9 months prior to implementation of the interchange and the interchange group data will be obtained from admissions for 9 months after. Approximately 40 hemodialysis patients are identified in each group. Parameters collected, spanning the time periods of 2 months before, during, and after hospitalization, include demographics, Hgb levels, EGF dosing, iron therapy, iron studies, nature of HD, diagnosis for hospitalization, hospital length of stay, surgical interventions, and transfusions. Descriptive and parametric statistics will be utilized to measure differences between the two groups.

Results:
Data collection is in progress. Results comparing the clinical and economic parameters between the two groups will be presented.

Learning Objectives:

To describe the rationale and principles of a recently implemented therapeutic interchange program.

To understand the potential clinical and economic impact of implementing a therapeutic interchange program for erythropoietic growth factors in adult hemodialysis patients.

Self Assessment Questions:

T/F. Epoetin and darbepoetin have both shown therapeutic equilavence and comparable safety profiles.

Which of the following are benefits of using darbepoetin versus epoetin for the treatment of anemia in the adult hemodialysis patient population?
a. Darbepoetin has a longer half-life than epoetin
b. Darbepoetin is dosed more frequently compared to epoetin
c. Darbepoetin efficacy in hospitalized patients has been shown to be superior to epoetin
d. None of the above

COLLABORATIVE DRUG THERAPY MANAGEMENT SERVICES IN AN OUTPATIENT PSYCHIATRIC CLINIC

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Purpose: Previous research suggests pharmacist interventions can positively impact patient compliance and cost in the schizophrenic patients. New atypical antipsychotic agents have demonstrated several advantages over older conventional agents; however, concerns exist. Obesity,diabetes and the need for more vigilant monitoring present unique opportunities for pharmacists to identify and resolve drug related problems. The objective of this project is to develop and implement a clinical pharmacist-based drug therapy management service that increases patient compliance, minimizes adverse drug events and reduces costs associated with antipsychotic use.
Methods: Prior to the protocol development, a literature evaluation will be performed to assess evidence supporting the impact of pharmacists in collaborative drug therapy monitoring programs in mental health. A focus group panel of clinicians, including two pharmacists, will design a drug therapy management protocol to be implemented. The design will include the development of a treatment algorithm for drug therapy management, a referral form, a history-taking questionnaire for both initial evaluation and follow-up evaluation, a metabolic monitoring form and physician's communication form, administration of long-acting injectable atypical antipsychotic agents, a follow-up letter to primary care providers to ensure continuity of care, and documentation in the patient's medical record.
Summary: The protocol will be presented to the Pharmacy and Therapeutics Committee in March and subsequently implemented. Patients will be enrolled as they are referred by collaborating and supervising physicians. Data will be collected to measure the impact of this service.
Conclusions: After the collaborative practice agreement is implemented and patients are referred for pharmacist monitoring, the project focus will turn to evaluating the impact of implementing this agreement. Possible areas for future study include the potential for outcomes research, including impact of treatment, patient compliance, and satisfaction with care. Also, future plans may include surveying physicians regarding satisfaction with the service.

Learning Objectives:

Describe the impact pharmacist's have made in the schizophrenic patient population, as supported by the literature.

List the activities that the collaborative practice agreement will allow the pharmacist to independently and collectively provide to the schizophrenic patient.

Self Assessment Questions:

Why is pharmacist involvement in medication management important in this setting?

What documentation strategies did the protocol development include to increase communication and interventions made by the clinical pharmacist?

DOES CYTOCHROME P450 2C9 GENOTYPE PREDICT PHENOTYPE IN CANCER PATIENTS?

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Introduction: Oxidative metabolism via hepatic cytochrome (CYP) P450 is a major pathway for drug elimination. Previously published in vitro and in vivo data has demonstrated that elevated levels of cytokines, such as IL-6 and TNF-alpha, can diminish CYP450 enzymatic activity. Patients with cancer are not only likely to have elevated levels of cytokines buy also to be taking multiple hepatically metabolized drugs, including those processed by the CYP2C9 isoenzyme. The purpose of this study is to investigate the relationship between cytokine levels and CYP2C9 enzymatic activity in patients with cancer, as well as the correlation between CYP2C9 genotype and phenotype.

Methods: This is a prospective study which will enroll 10 subjects with cancer, and 10 healthy demographically matched volunteers. Blood will be drawn from each subject for genotyping and measurement of cytokine levels. The subject will then receive one 500mg oral dose of tolbutamide, a CYP2C9 substrate and commonly used marker of enzymatic activity. Serial plasma concentrations of tolbutamide and its metabolites will be measured up to 24 hours post-dose, and urine will be collected for the first 12 hours to determine the amount of 4-hydroxytolbutamide and carboxytolbutamide eliminated. The information in subjects with cancer will then be compared to healthy volunteers to better characterize CYP450 2D6-mediated drug metabolism.

Results: Three subjects with cancer have completed the study to date. Enrollment is ongoing and additional data will be presented at the Great Lakes Pharmacy Resident Conference in April 2005.

Learning Objectives:

1. Describe the importance of cytochrome P450 2C9 as route for drug elimination and the expected effect of genotype on enzymatic activity.

2. Discuss the basis of the hypothesis that CYP2C9 genotype may not be predictive of phenotype in patients with cancer.

Self Assessment Questions:

1. All of the following medications have the potential to cause significant toxicities. Which is/are associated with the CYP2C9 isoenzyme (either inducer, inhibitor, or substrate)?
 a. phenytoin
 b. amiodarone
 c. warfarin
 d. all of the above

2. True or False: Elevated levels of cytokines have been correlated with enhanced P450 metabolic activity.

EVALUATION OF PHARMACIST INVOLVEMENT IN MEDICATION RECONCILIATION UPON HOSPITAL ADMISSION AND DISCHARGE

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Background:
In the Institute of Medicine report, “To err is human: building a safer health system,” medication errors were listed as a leading cause of patient morbidity and mortality. It also noted an increased number of errors due to prescribers' lack of drug knowledge and patient information. As a result, the Joint Commission on Accreditation of Healthcare Organizations included a National Patient Safety Goal requiring medication reconciliation across the continuum of care.

Objective:
To evaluate the benefit of a pharmacist's involvement in reconciling a preoperative patient medication list to improve the accuracy and completeness of admission and discharge medication lists.

Methods:
A retrospective review will be conducted with recently discharged, postoperative patients, 60 years of age or older. Patient medication lists completed by nursing staff, admission orders, and previous discharge summaries will be compared. Discharge orders, recent medication administration records, and the admission medication list will also be compared.

In addition, a prospective study will be conducted where surgical patients will complete and return a pre-procedure medication list before admission. A pharmacist will compare this with medication lists from their outpatient pharmacy, clinic, and recent discharge summaries. The pharmacist will consult the patient to correct discrepancies and create the reconciled, pre-admission medication list. If discrepancies exist between this list and admission orders, the pharmacist will suggest that medications be changed accordingly. A pharmacist will also compare the pre-admission list with the discharge list and recent medication administration record. If necessary, the pharmacist will suggest that medications be changed accordingly before discharge.

Results:
Within the retrospective and prospective studies, medication discrepancies of omission, dose, route, frequency, and formulation will be compared and presented. The number of resolved discrepancies and severity of errors, based on the National Coordinating Council for Medication Error Reporting and Prevention Index, will also be compared and presented.

Learning Objectives:

Describe the benefit of pharmacist-reconciled, pre-admission medication lists.

Identify the need for communication of a pharmacist-reconciled, pre-admission medication list to physicians in order to enhance medication reconciliation throughout the continuum of inpatient care.

Self Assessment Questions:

True or False: Pharmacist involvement in medication reconciliation upon admission and discharge decreases the incidence of medication discrepancies and severity of patient harm.

True or False: The communication of a pharmacist-reconciled, pre-admission medication list is necessary for the improved efficiency of medication reconciliation by any health care provider within the continuum of inpatient care.

OUTCOME OF PATIENTS RECEIVING DOSE-ADJUSTED CASPOFUNGIN THERAPY

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BACKGROUND: Caspofungin acetate is an antifungal agent used to treat infections caused by Candida and Aspergillus species. The clearance of caspofungin has been shown to be decreased in patients with documented cirrhosis. However, in clinical practice, dose adjustments may be done in patients without cirrhosis, but who are perceived to have hepatic impairment based on laboratory abnormalities. Consequently, patients may be at risk for underdosing if laboratory abnormalities do not correspond to hepatic insufficiency or to decreased clearance of caspofungin. This research project will examine the outcome of patients receiving dose-adjusted caspofungin therapy at the University of Michigan Hospitals and Health Centers (UMHHC).

METHODS: This study will be a retrospective chart review of all adult patients who have received dose-adjusted caspofungin (35 mg daily) at UMHHC during a 3-year period. Due to the lack of established caspofungin doses for the pediatric population, patients less than 18 years old will be excluded. Data to be collected include demographics, documentation of liver disease, significant comorbidities, various laboratory and diagnostic data, documented or suspected fungal infection, dose/duration of caspofungin and additional antifungals used, APACHE II scores, length of stay in an intensive care unit, overall length of stay, and mortality. The efficacy of the reduced dose of caspofungin in the treatment of fungal infection will be evaluated using criteria validated in a previous study which assessed caspofungin for invasive candidiasis. Additional outcomes which will be assessed include the use of the Child-Pugh classification scheme in this patient population, the percent of patients who were appropriately dosed on caspofungin throughout therapy, length of stay, and mortality.

RESULTS: Data is currently being collected, and results will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Describe the mechanism of action, the spectrum of activity, and the pharmacokinetics of caspofungin.

Explain the impact of the Child-Pugh classification scheme as it relates to the dosing of capsofungin.

Self Assessment Questions:

What is the primary route of caspofungin elimination?
a. Metabolism by hydrolysis and N-acetylation
b. Metabolism by CYP3A4
c. Extensive distribution into tissue
d. Renal clearance via unchanged excretion into the urine

In a patient with candidemia and a Child-Pugh score of 8, what is the proposed caspofungin dose?
a. 70 mg IV loading dose on day 1, then 50 mg IV daily
b. 50 mg IV loading dose on day 1, then 35 mg IV daily
c. 35 mg IV daily throughout therapy
d. 70 mg IV loading dose on day 1, then 35 mg IV daily

IMPACT OF EXOGENOUS SURFACTANT ON LENGTH OF STAY IN EXTREMLY LOW BIRTH WEIGHT INFANTS

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Respiratory distress syndrome (RDS) is the most common acute pulmonary disease in preterm neonates. RDS causes increased neonatal hospital length of stay and increased costs to the hospital. Exogenous surfactant reduces mortality and morbidity in infants with RDS. However, administration of exogenous surfactant may vary between practice sites. Incidence of RDS is significantly reduced by the use of antenatal corticosteroids, which became the standard of practice after the 1994 National Institutes of Health (NIH) consensus statement supporting antenatal corticosteroid therapy.

The National Institute of Child Health and Human Development-Neonatal Research Network developed a national database that collects data from 154 academic centers around the country, which make up 14 regional centers. Cincinnati regional data will be used for the current retrospective, multi-center trial.

The database will be used to identify premature (<30 weeks gestational age) extremely low birth weight infants weighing between 401 to 1000 grams (n @ 1400). Data will be collected from 1995 to 2003 to only include data after the 1994 NIH consensus statement. Data to be collected will include: use of antenatal corticosteroids, signs and symptoms of RDS, use of exogenous surfactant, and hospital length of stay. All data obtained and recorded will be de-identified from both the mother and neonate, and the data will be kept confidential. Average hospital length of stay will be determined by national averages for similar neonatal birth weights and ages. The primary outcome of this study will be length of NICU stay. Multi-regression analysis will be utilized to ascertain if exogenous surfactant therapy impacts hospital length of stay after controlling for neonatal necrotizing enterocolitis and sepsis comorbities, as well as birth weight, gestational age, antenatal corticosteroid use, and chronic lung disease development. Overall mortality will also be evaluated.

Learning Objectives:

Describe the role of exogenous surfactant in the treatment of neonatal respiratory distress syndrome.

Discuss the influence of neonatal co-morbidities on neonatal length of stay.

Self Assessment Questions:

What is the mechanism of action of exogenous surfactants in the prevention/treatment of neonatal respiratory distress syndrome?

True/False Antenatal corticosteriods have always been the standard of care in the prevention of neonatal respiratory distress syndrome.

FOURTH PROFESSIONAL YEAR PHARMACY STUDENTS IN THE AMBULATORY CARE SETTING: AN ASSESSMENT OF THE STUDENT'S ROLE AND SERVICES AS PERCEIVED BY THE PATIENT

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Purpose
The importance of establishing a patient-provider relationship based on active participation and collaborative reciprocity is implicit throughout the health care profession. These relationships encourage cooperation by patients, making them active participants in drug therapy decisions and disease state management. It is essential that pharmacy students acquire the necessary skills and attitudes that foster such active relationships. Studies demonstrate that students on clerkship provide quality pharmaceutical care in various settings as determined by humanistic outcomes. Also, economic outcomes of interventions have been estimated; however, few studies have investigated patient satisfaction with pharmacy student services, or patient evaluation of pharmacy student performance. Therefore, the objective of this study is to assess how patients perceive the pharmacy student's role in an ambulatory care setting including satisfaction with services, effectiveness of patient care, and an examination of the advice patients have to offer pharmacy students.

Methods
Fourth year professional Pharm.D. candidates on clerkship at an ambulatory care clinic within a multi-specialty group practice in suburban Chicago conducted medication histories on a convenience sample of patients. The medication histories involve counseling on prescription and over-the-counter medications, making recommendations to modify drug therapy, and suggesting laboratory parameters to monitor. Afterwards, patients are administered a survey by the Pharm.D. candidate. The survey is divided into 3 sections: Interaction with pharmacy student in the past, Interaction with pharmacy student today, and Demographics. Patients are informed that the Pharm.D. candidate is blinded from results.

Results
Fifty surveys are completed; data will be analyzed using descriptive statistics and predictors of patient satisfaction will be determined by regression analysis.

Conclusion
Data collection is ongoing; results and conclusions to be presented. Results may be used at different organizations to identify previously unknown benefits of pharmacy student interventions as well as possible areas for improvement regarding the professional development of pharmacy students.

Learning Objectives:

To recognize the importance of promoting excellence within the health care profession.

To assess patient satisfaction of pharmaceutical care provided by fourth year professional Pharm.D. candidates.

Self Assessment Questions:

True or False: Patient satisfaction with pharmacy students does not need to be assessed.

True or False: Services provided by pharmacy students can be an integral component of the health care a patient receives.

EVALUATION OF CHOLESTEROL MANAGEMENT IN FEMALE PATIENTS WITH DIABETES

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Background: Coronary heart disease (CHD) continues to be a significant complication of diabetes mellitus (DM), with up to 80% of patients developing a major vascular event. Recent National Cholesterol Education Program Adult Treatment Panel III guidelines (ATP III) categorize DM as a CHD risk equivalent, elevating the risk for a major coronary event to >20% per 10 years and identifying these patients as “high risk”. Elevated LDL cholesterol (LDL-c) remains the primary target of therapy, and strict control in patients with DM is warranted, particularly through the use of HMG-CoA reductase inhibitors (statins) to maintain LDL-c <100mg/dL. ATP III guidelines were recently updated to categorize patients with DM and CHD as “very high risk” and recommend an LDL-c goal of <70mg/dL in these patients using moderate doses of statins. Recent clinical studies evaluating CHD risk reduction with statin therapy have demonstrated substantial benefit in females and patients with DM. Furthermore, updated Evidence-Based Guidelines for Cardiovascular Disease Prevention in Women stress the importance of aggressive cholesterol management in females, recommending initiation of statin treatment for “high risk” women regardless of baseline LDL-c.

Objectives:To assess compliance with published lipid lowering therapy recommendations for primary and secondary prevention of CHD in female patients with DM.

Methods: This study will be a retrospective chart review of 250 female patients at the Jesse Brown VA Medical Center (JBVAMC) with a diagnosis of DM between January 1, 2003 and June 30, 2004. The primary endpoint is to determine compliance with treatment to LDL-c goal of <100mg/dL as per current guidelines. Secondary endpoints include identification of female patients with DM and existing CHD to assess if an LDL-c goal of <70mg/dL is being met, evaluation of non-HDL goal achievement, and assessment of dose and monitoring of lipid lowering therapy.

Results/Conclusions: Pending

Learning Objectives:

Identify percentage of female patients in compliance with established lipid lowering guidelines.

Assess trends in dosing and monitoring of various lipid lowering therapies, particularly statins.

Self Assessment Questions:

T or F: LDL-c goals differ between males and females with equivalent CHD risk status.

Which of the following are increased risk states for statin-associated myopathy?
a. Advanced age (especially >80 years)
b. Alcohol abuse
c. Small body frame and frailty
d. Concomitant use of fibrates
e. All of the above

DEVELOPMENT OF RISK STRATIFICATION GUIDELINES FOR TREATMENT OF PULMONARY EMBOLISM

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Background: Recent studies suggest that certain laboratory indices and clinical findings may predict an increased risk of patients experiencing major adverse outcomes secondary to pulmonary embolism (PE). Adverse outcomes may include recurrent thromboembolism, hemorrhage, or death. Clinical findings associated with this increased risk include the presence of cancer, hypotension, heart failure, previous deep venous thrombosis, hypoxemia, ultrasound-proven deep vein thrombosis, and right ventricular dysfunction. Brain natriuretic peptide and cardiac troponin I and T levels are the biomarkers recently shown to be indicative of right ventricular dysfunction in the setting of PE. The presence or absence of these clinical and laboratory findings may help determine which patients may be more promptly and safely discharged with outpatient therapy. These risk factors may also help identify patients who may require more aggressive therapy and clot resolution using thrombolytics or embolectomy to help prevent major adverse outcomes.

Purpose: To assess whether risk factors for major adverse events secondary to PE were determined upon the patients' initial hospitalization for the treatment of pulmonary embolism. The presence or absence of these risk factors in conjunction with the patients' outcomes will be used to develop a pulmonary embolism risk stratification treatment guideline for St. Vincent Hospital.

Methods: This retrospective chart review examines whether patients who experienced a major adverse event after being discharged from the hospital with treatment for PE had any identifiable risk factors for experiencing these adverse events on their initial hospitalization. Risk factors examined include the presence of cancer, hypotension, heart failure, previous deep venous thrombosis, hypoxemia, ultrasound-proven deep vein thrombosis, and right ventricular dysfunction as identified by echocardiogram, cardiac troponin I and T levels, and/or brain natriuretic peptide.

Conclusion: Study results will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Name the risk factor(s) most closely associated with adverse events secondary to pulmonary embolism in this study.

Describe why cardiac troponins are emerging as a risk factor for adverse events secondary to pulmonary embolism.

Self Assessment Questions:

What risk factor(s) were identified to be most closely associated with adverse events secondary to pulmonary embolism at St. Vincent Hospital?

Why are cardiac troponins emerging as a risk factor for adverse events secondary to pulmonary embolism?

INITIATION OF A PHARMACIST PROVIDED WARFARIN DOSING SERVICE

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Purpose: The purpose of this trial is collect baseline information on current warfarin dosing and compare these results to that of the pharmacist managed service. The primary endpoint of the study is to compare the effectiveness of pharmacists and physicians in obtaining therapeutic anticoagulation on initiation of warfarin by comparing the percentage of days in the therapeutic range. Secondary endpoints include the number of patients discharged before their international national ratio (INR) is stabilized, number of patients with a major bleed or adverse event, length of time patients remained on low molecular weight heparin (LMWH) or heparin infusion, number of patients with an INR greater than four, number of patients requiring vitamin K for reversal, and the number of patients with concurrently prescribed drugs known to significantly interact with warfarin.

Methods: A retrospective chart review will be done of 30 warfarin patients that were managed by physicians during their stay at Borgess Medical Center. Information from these patients will be recorded on the warfarin utilization data collection form. Once this information is collected, a prospective cohort (pilot program) which utilizes a pharmacist (via voluntary consult by the physician) to monitor and dose warfarin will be initiated. A warfarin data collection form will again be used to gather this information collected by a pharmacist. Information gathered from each group will be used to compare the results between the two services (physicians or pharmacists).

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

Learning Objectives:

Describe warfarin dosing protocols to pharmacists responsible for inpatient care.

Apply knowledge obtained to properly recommend a warfarin dosing regimen.

Self Assessment Questions:

Describe the difference between an induction dose and a loading dose of warfarin for initiation of therapy.

How long does it take to see an anticoagulant effect after warfarin therapy is initiated?

DESIGNING, IMPLEMENTING AND EVALUATING AN ADVANCED PRIMARY LITERATURE ELECTIVE COURSE PHARMACY STUDENTS

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Evidence-based health care demands an increasing need for practitioners to understand and critically evaluate the primary literature. Pharmacists are an important component of a health care team and usually serve as the best resource for drug information (DI). DI and primary literature evaluation skills are an important component of the pharmacy curriculum. Most schools of pharmacy have a course dedicated to teaching student the basics of providing drug information and evaluating the medical literature. However, increasing class size and time constraints limit the instruction and application of advanced skills.

Objective: To create a two-credit elective course, for third professional (P3) year pharmacy students that will enhance their knowledge and application of primary literature and its influence on clinical guidelines.

Methods: A 16-week course syllabus was created to reflect the core course objectives. Course topics include review of study design, interpretation of statistics, analysis of pharmacoeconomic studies, and clinical practice guideline application. Alternating didactic lectures and in-class article analyses will allow for practical application of literature evaluations skills. Student assessment techniques include class participation, journal club presentations, and therapeutic debates. Evaluation forms were created to assess student, instructor and course performance. The course is being offered during the Spring 2005 semester at Purdue University.

Results: Details of the course structure, including the syllabus, course content, grading criteria, evaluation forms, and final evaluations will be presented.

Learning Objectives:

To discuss the need for an advanced elective related to primary literature evaluation.

To outline the course content and evaluative process used during the semester.

Self Assessment Questions:

Give two reasons why an advanced elective in primary literature evaluation was created.

True / False: The focus of this elective is to teach students the importance and application of medical writing as it pertains to clinical pharmacy.

EVALUATION OF THE IMPACT OF A VENOUS THROMBOEMBOLISM (VTE) PROPHYLAXIS INITIATIVE AT A VA HOSPITAL

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Purpose:
The purpose of this project is to evaluate the use of the VTE prophylaxis initiative at the Milwaukee VA Medical Center and to determine if VTE prophylaxis is being used appropriately.

Methods:
Prior to commencement, this study was approved by the Institutional Review Board. The medical center's computerized patient record system was used to identify, for each ward using the VTE prophylaxis order set, the total number of admissions per month and the number of those admissions with a VTE prophylaxis order. The following data will be collected: the number of admissions per month, the number of admissions with a VTE prophylaxis order per month, and the number of orders for each of the seven VTE prophylaxis options (heparin 5,000 units SC q8hr, enoxaparin 40mg SC daily, renally adjusted enoxaparin 30mg SC daily for creatinine clearance <30 mL/min, contraindicated, refused, risk>benefit, no risk) per month. A subset of each order group not receiving treatment was evaluated to assess appropriateness of risk stratification and choice of prophylaxis. The utilization of SC heparin and enoxaparin preceding and following the initiation of the order set will also be evaluated.

Results/Conclusions:
Preliminary results show that between 35 and 45% of patients admitted to the hospital have an order for VTE prophylaxis entered in the admission order set.
Data collection is ongoing. Final results and conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:

Identify the risk factors for VTE.

Identify the treatment options for VTE prophylaxis and contraindications for prophylaxis.

Self Assessment Questions:

True or False: Studies have shown that approximately 50% of patients at risk for VTE receive prophylaxis.

True or False: The VTE prophylaxis dose of enoxaparin is 1 mg/kg twice a day.

UTILIZATION OF EZETIMIBE IN THE TREATMENT OF DYSLIPIDEMIA

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Background: Ezetimibe (Zetia®) is the first drug in a new class of lipid lowering agents. Ezetimibe inhibits the absorption of cholesterol at the brush border of the small intestine. The Food and Drug Administration has approved the administration of ezetimibe alone or in combination with hydroxymethylglutaryl Coenzyme A (HMG-CoA) reductase inhibitors (statins) for the management of primary hypercholesterolemia.

Purpose: To determine if patients at Hines VAMC are prescribed ezetimibe according to the National VA Pharmacy Benefits Management – Medical Advisory Panel (PBM-MAP) criteria for use. The specific aims to meet this goal are as follow: 1) To describe the use and growth of ezetimibe at Hines, 2) To determine the use of other anti-lipidemics prior to and in combination with ezetimibe, 3) To determine the number of patients meeting their low density lipoprotein cholesterol (LDL-C) goals once ezetimibe is administered, 4) To determine the rate and reasons for discontinuation of ezetimibe, 5) To determine the safety and tolerability of ezetimibe combined with statins.

Methods: This is a descriptive retrospective database and chart review study evaluating the use of ezetimibe at Hines VAMC. The study will evaluate patients who received at least one prescription for ezetimibe between June 1st 2003 and September 30th 2004. The patients' anti-lipemic therapy prior to ezetimibe will be assessed for efficacy, safety and tolerability and adherence. Efficacy will be measured by attainment of goal LDL-C levels based on the National Cholesterol Education Program Adult Treatment Panel (NCEP ATP III) recommendations. Safety and tolerability will be assessed by documentation of reported adverse drug events, elevated LFTs, and/or creatinine phosphokinase (CPK) in the computerized medical record along with adherence. Documentation of patient-reported side effects, elevated LFTs and/or CPK after addition of ezetimibe will be recorded along with LDL-C.

Conclusion: The results and conclusions will be presented at the conference.

Learning Objectives:

To identify if ezetimibe is being used according to the National VA PBM-MAP criteria for use.

To evaluate the efficacy, safety and tolerability of ezetimibe as monotherapy or in combination with other anti-lipidemics.

Self Assessment Questions:

More patients achieved their LDL-C goals when ezetimibe was combined with statins compared to statins alone. T F

According to the National VA PBM-MAP criteria, which of the following would be a potential candidate for ezetimibe therapy?
a. Patient LDL-C goal not met on maximum dose of statin in combination with a bile acid sequestrant (BAS) or niacin.
b. Patient unable to tolerate maximum dose of statin
c. Patient unable to use statin due to drug interaction with CYP 3A4 metabolism and goal LDL-C not met on maximally tolerated dose of pravastatin or fluvastatin in combination with BAS or niacin
d. All of the above
e. None of the above

PROSPECTIVE EVALUATION OF THE SAFETY AND EFFICACY OF MEPERIDINE VERSUS FENTANYL FOR PROCEDURAL SEDATION IN GASTROINTESTINAL ENDOSCOPIES AT A LARGE COMMUNITY TEACHING HOSPITAL

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Meperidine has historically been the opiate analgesic of choice for procedural sedation. However, its use is associated with numerous safety concerns. The primary adverse effects of opiates are central nervous system and respiratory depression, and nausea and vomiting. In addition, accumulation of meperidine's active metabolite, normeperidine, in patients with renal insufficiency can lead to neurotoxic effects.

In light of the concerns involving meperidine, various agencies and organizations have recommended limiting its use. Recently, Advocate health system created guidelines for the use of meperidine, which removed procedural sedation as an appropriate indication. At Advocate Lutheran General Hospital (ALGH), meperidine is still favored by some prescribers in the GI lab. In clinical practice, the preferred alternative narcotic agent available for adult procedural sedation is fentanyl. As compared to meperidine, fentanyl has a quicker onset and a shorter duration of action, and its pharmacokinetics are not altered by renal impairment.

The purpose of this project is to evaluate the continued use of meperidine for procedural sedation in the ALGH GI lab. The medication use evaluation will characterize the use of meperidine and fentanyl. In addition, the adverse effects and recovery time associated with meperidine and fentanyl use pre-procedurally will be assessed and compared. Results from this evaluation will be used to guide the appropriate use of narcotics in procedural sedation in order to improve patient care.

Data collection will be conducted from December 2004 to February 2005. Patients included are outpatients undergoing procedural sedation with meperidine or fentanyl during a gastrointestinal endoscopy in the ALGH GI lab. Parameters that will be evaluated include adverse effects, post procedural nausea and vomiting, recovery time, recollection of events during the procedure, and the dosage of midazolam given in conjunction with the narcotic agents.

Results/Conclusion: Data collection and analysis in progress.

Learning Objectives:

Discuss the safety concerns involved with inappropriate meperidine use.

Understand the clinical implications of narcotic use in procedural sedation.

Self Assessment Questions:

Naloxone reverses the effects of normeperidine. T or F

Meperidine should be used with caution in:
a. Patients with pre-existing convulsive disorders
b. Patients with atrial flutter.
c. Patients with drug-induced or blood product-induced rigors.
d. b and c
e. a and b

ASSESSING THE IMPACT OF A COMMUNITY PHARMACY-BASED SCREENING AND EDUCATION PROGRAM FOR PREDIABETES PATIENTS.

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Objective: This pilot study will evaluate improvements of baseline blood glucose, A1C, activity level, and attitudinal changes through pharmacist interventions for patients identified at high risk for diabetes.

Methods: This is a prospective, randomized, controlled trial conducted in a community pharmacy. Subjects visiting the community pharmacy will be asked to complete the ADA Diabetes Risk Form. Subjects will be excluded if they are less than 18 y/o, women known to be pregnant, score < 10 on the ADA Diabetes Risk Form, or diagnosed diabetes (with or without drug therapy). For subjects who score 10 or greater, a random capillary blood glucose sample will be taken. If a subject's blood glucose level is 160mg/dl or above, they are study eligible and randomized into either an intervention or non-intervention group. Risk screening information will be shared with subject's physician who fall into the prediabetes category. Subjects in the intervention arm will receive monthly pharmacist counseling on lifestyle modifications and diabetes education. Additional group education sessions will be available to intervention subjects. Non-intervention subjects will only receive a physician referral and recording of outcomes data at baseline and study conclusion. Monitoring will occur over 90 days. Outcomes data collected at baseline, monthly, and final visit include: fasting capillary blood glucose, A1C, weight, attitudinal changes, and activity level assessments.

Results: Dependent variables are blood glucose, A1C, weight, and self-reported activity. Independent variables are race, age, gender, pre-existing conditions, and diabetes risk factors. When the study concludes, the Student t-test will be used to compare group means for continuous variables.

Conclusion: N/A

Learning Objectives:

Identify patients with prediabetes using the American Diabetes Association criteria.

Identify where community pharmacist can impact the care of patients with prediabetes.

Self Assessment Questions:

Diet and exercise has been proven to prevent or delay diabetes.
a. True
b. False

Which of the following is not a risk factor for prediabetes?
a. 65 years or older
b. family history of diabetes
c. Women delivering babies over 9 lbs.
d. Smoking
e. Being over weight

EFFECT OF HMG-COA REDUCTASE INHIBITORS ON OUTCOMES IN PATIENTS WITH SUBARACHNOID HEMORRHAGE

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Background: Subarachnoid hemorrhage (SAH) is associated with devastating outcomes, including delayed symptomatic neurological deficits resulting from vasospasm seen in at least fifty percent of patients and correlates with a 1.5 to 3-fold increase in mortality. Vasospasm results from prolonged contraction of the arterial wall smooth muscle mediated through a direct effect on the muscle fibers and an indirect mechanism via release of vasoactive substances, production of free radicals and lipid peroxides which contribute to decreased activity of nitric oxide synthase (NOS) and nitric oxide (NO) production. Currently, triple-H (hypertensive/hemodilution/hypervolemia) therapy is the mainstay of treatment. However, based on the proposed etiology of vasospasm, HMG-CoA reductase inhibitors appear to be protective against cerebral injury in normocholesterolemic mice. Postulated mechanisms include selective up-regulation of endothelial nitric oxide synthase (eNOS) expression and activity, and prevention of down-regulation of eNOS by oxidized-LDL (ox-LDL).

The objective of this study is to evaluate the effects of HMG-CoA reductase inhibitors on SAH associated outcomes in patients.

Methods: Patients over the age of eighteen admitted with a diagnosis of SAH to the neurosurgical intensive care unit from January 2000 to October 2004 will be included in the study. Patients without an aneurysmal source will be excluded. This retrospective study will compare the degree of vasospasm and subsequent clinical outcomes among patients on HMG-CoA reductase inhibitors prior to experiencing a SAH and those never initiated on a statin. Data will be gathered from existing medical charts including patient demographics, vasospasm therapy utilized, cerebral angiogram and CT reports, time of initiation of a statin, patient outcomes, Fisher grading and Hunt-Hess grading scores, Glasgow coma scale (GCS) and Glasgow coma outcome scale (GOS) scores.

Collected data will be analyzed using specified criteria for vasospasm and SAH-associated outcomes, with results presented at the Great Lakes Conference.

Learning Objectives:

To establish whether prior treatment with an HMG-CoA reductase inhibitor affects vasospasm and clinical outcomes in patients with SAH.

To determine whether clinical outcomes are affected by the time of initiation of statins, and whether there is a difference in benefit(s) with statins across the Fisher and Hunt-Hess grading scale.

Self Assessment Questions:

Triple-H therapy is currently the mainstay of treatment for vasospasm based on documented efficacy from numerous randomized control trials. True or False.

HMG CoA reductase inhibitors augment cerebral blood flow, reduce the infarct size, and improve neurological function in mice, by reversing the effects of ox-LDL on eNOS and enhancing its up-regulation via nitric oxide production. True or False.

INCIDENCE OF DEPRESSION IN HEPATITIS C VIRUS PATIENTS TREATED WITH PEGYLATED INTERFERON ALPHA 2A AND RIBAVIRIN

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Background:
The incidence of depression in patients with the hepatitis C virus (HCV) receiving interferon and ribavirin therapy can be seen in up to 30% of patients. Depression is a well recognized and potentially serious side effect of therapy with interferons, including pegylated interferons. Active depression before and during therapy HCV treatment remains a significant concern for both the patient and the healthcare team. The purpose of this study is to identify the incidence of depression in veterans receiving hepatitis C virus treatment at the Lakeside Community Based Outpatient Clinic (CBOC), and whether the prevalence suggests a definite role for prophylaxis antidepressant therapy prior to initiation of HCV treatment.

Methodology:
In this retrospective chart review, patients must: be chronically infected with the hepatitis C virus as indicated by viremia (via a qualitative or quantitative polymerase chain reaction {PCR} test), be candidates for HCV treatment as per current standard of care at the VA, and complete a Beck's Depression Inventory (BDI) prior to therapy and at four week intervals for at least the first twelve weeks of therapy. Patients will be selected through a search in the Veteran Affairs prescription database from July 2003 – December 2004. The BDI will be the monitoring tool in this study for detecting the presence of depression.

Results/Conclusions:
The results and conclusions of this study will be presented at the Great Lakes Residency Conference.

Learning Objectives:

To identify the possible mechanisms of interferon related depression.

To identify the incidence of depression in the veteran population with hepatitis C treated at the Lakeside CBOC.

Self Assessment Questions:

True/False: The current hepatitis C virus guidelines indicate that antidepressant therapy should be started once a patient scores 16 on the BDI?

Describe one possible mechanism for interferon induced depression in hepatitis C patients.

ASSESSMENT OF ADULT ASTHMA PATIENT VISITS IN THE EMERGENCY DEPARTMENT AT THE UNIVERSITY OF ILLINOIS MEDICAL CENTER CHICAGO

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In 1995, there were 1.9 million asthma emergency department (ED) visits, with approximately 450,000 hospital admissions and 5,000 deaths nationwide. Between 1990 and 1997 there were 950 asthma related deaths in Chicago, which was more than double the national rate. In 2003, 46% of asthmatics were hospitalized, treated in the ED, or required urgent care for their asthma. The ED is usually the primary care site for asthmatics in urban areas. Researchers have found a correlation between poverty, urban residence and increased asthma related morbidity and mortality. Urban African Americans and Hispanics have higher rates of asthma mortality and utilization of health-care than Caucasians. The University of Illinois Medical Center at Chicago (UIMCC) serves an urban, indigent population. Treatment is based on the hospital's Adult Asthma Management Guidelines, part of the UIMCC Clinical Care Guidelines. The purpose of this study is to identify trends in patient characteristics and patterns of ED use, as well as to identify barriers to treatment in order to improve asthma management of adult ED patients.

This retrospective chart review evaluated adult patients with International Classification of Diseases, Ninth Revision (ICD-9) code diagnosis of asthma, seen in the ED of the UIMCC from 4/1/04 to 8/31/04. Data included: demographics, number of ED visits, ED asthma assessment and management, past medical history, payor status, outpatient medications, patient disposition, follow-up was scheduled, discharge prescriptions, medication compliance, barriers to medication compliance, regular care by a primary care physician.

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

Learning Objectives:

Identify barriers to patient care leading to treatment of asthma in the ED.

Discuss what treatment options are available for ED adult asthma patients.

Self Assessment Questions:

True or False Patient's peak flow should be measured after they receive bronchodilator treatment in the ED.

True or False Urban patients are more likely to have barriers to treatment and to seek care in EDs.

RETROSPECTIVE REVIEW OF TREATMENT OUTCOMES FOR HEPATITIS C VIRUS (HCV) IN A VETERAN POPULATION

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Purpose: Hepatitis C virus (HCV) is one of the leading causes of liver disease in the United States and left untreated can lead to cirrhosis, hepatic failure, and hepatocellular carcinoma. The highest response rates to HCV treatment have been demonstrated with the combination of pegylated interferon alpha plus ribavirin. Clinical trials usually select for healthier patients. Veterans are a special population, as they tend to be older and have more co-morbidities. This study was designed to specifically evaluate treatment outcomes in veterans and to determine if one of three treatment regimens is superior to others in treating this patient population. Methods: The Cincinnati Veterans Affairs Medical Center computerized patient record system will be utilized to identify patients who have received treatment for HCV with one of three treatment regimens; interferon alfa-2b and weight-based ribavirin (Rebetron), pegylated interferon alfa-2b (Peg-Intron) and ribavirin 800mg daily, or pegylated interferon alpha-2a (Pegasys) and weight-based ribavirin. Patients will be included if they have received one of the above treatments beginning on or after March 13, 2000, with end of treatment completed by August 1, 2004. Patients will be excluded if they have HIV/AIDS or were treated with an experimental therapy. Data collected will include: patient demographics, co-morbidities, HCV genotype, viral load, liver enzymes, liver biopsy score, HCV treatment regimen, concomitant medications, medication refill records, adverse events, and any pertinent physical examination findings. Chi-square and analysis of variance will be used to detect differences across groups.
Results: Preliminary data indicate that 58% of veterans treated with Rebetron achieved a sustained viral response (SVR), but less than 20% of veterans treated with Peg-Intron and 800 mg ribavirin achieved a SVR. Final data will include response rates with Pegasys and weight-based ribavirin. Conclusion: Preliminary results indicate that the veteran population may response differently than healthier clinical trial populations.

Learning Objectives:

To review the various treatment options available for Hepatitis C Virus (HCV).

To compare treatment responses according to HCV genotype, race, and viral load.

Self Assessment Questions:

True or False: Patients that fail to respond to one type of interferon will not respond to another type of interferon.

Which of the following treatment regimens is most effective in the Cincinnati VA patient population in achieving a SVR: interferon alfa-2b and weight-based ribavirin, pegylated interferon alfa-2b and ribavirin 800mg daily, or pegylated interferon alfa-2a and weight-based ribavirin?

MAJOR BLEEDING ASSOCIATED FROM THE USE OF LMWHS IN PATIENTS WITH RENAL INSUFFICIENCY.

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Introduction: LMWHs have generally replaced UFH as the drug of choice in patients with DVT, NSTEMI, and unstable angina. Their efficacy is good and overall there is less laboratory monitoring compared with UFH. Because of extensive renal elimination, many trials evaluating LMWHs excluded patients with renal insufficiency (Scr > 2.0). In December 2003, Aventis received dosing recommendations for enoxaparin in patients with a CrCl < 30. Despite these recommendations in October 2004 the 7th ACCP antithrombotic guidelines recommended UFH over LMWH in patients with renal insufficiency. In this project, we will evaluate the frequency of major bleeding with treatment doses of enoxaparin and dalteparin in patients with renal insufficiency, and attempt to determine what effect dose reduction has on the major bleeding rate.

Methods: A prospective medication usage evaluation is being conducted to evaluate major bleeding associated with treatment doses of LMWHs. The criteria for major bleeding will be a >3g/dL drop in hemoglobin, any blood transfusion, and intracranial, intraocular, or retroperitoneal bleeds. Indication, dose, and CrCl will be documented from each instance of major bleed. Major bleeding will be compared in these groups using the chi-square test.

Results: The data has been partially collected. We hope to determine if renal insufficiency impacts the incidence of major bleeding with LMWHs and if dose reduction influences the major bleeding rate.

Learning Objectives:

Recognize the need for proper dosing of enoxaparin and dalteparin in patients with renal impairment

Distinguish the major bleeding rate between patients with normal renal function and renal insufficiency, normal or reduced dose.

Self Assessment Questions:

Will there be a significant different in major bleeding rates in patients with renal impairment who receive a reduced dose of LMWH?

Will LMWHs be approved for use in patients with impaired renal function if an effective and safe dose can be administered?

EVALUATION OF FONDAPARINUX UTILIZATION AT A TERTIARY ACADEMIC MEDICAL CENTER

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Purpose: The objective of this study is to evaluate the non-formulary utilization of fondaparinux at The Ohio State University Medical Center (OSUMC).

Background: Fondaparinux is currently on the OSUMC Formulary with use restricted to orthopedic surgery, most of which takes place at our community hospital, University Hospitals East (UHE). Despite the restriction, fondaparinux is currently utilized as a non-formulary item, primarily in patients with heparin induced thrombocytopenia (HIT). Recently, the Food and Drug Administration (FDA) expanded the indications for fondaparinux to include treatment of deep vein thrombosis and pulmonary embolism when used in conjunction with warfarin. Because of the expanded indications, an increase in the non-formulary (non-orthopedic) use of fondaparinux is expected. This expected increase in utilization, both for FDA approved and non-FDA approved indications, in conjunction with the potential for a disruption in market share pricing of other formulary low molecular weight heparins, support an evaluation of current usage patterns.

Methods: A retrospective chart review is being conducted on adult patients admitted to the OSUMC who received fondaparinux between July 1, 2003 and June 30, 2004. Drug specific data collected will include indication for fondaparinux, dose used and duration of therapy. Other information to be collected includes: pertinent laboratory data (assessment for HIT and adverse events), anticoagulants received during hospitalization, complications of fondaparinux therapy (primarily bleeding), methods of treatment used for those complications, and reason for discontinuing fondaparinux. Data will be obtained from the patient's medical record, the online lab reporting system, the physician order entry system, and the pharmacy computer system. Data collected will be entered into a Microsoft Access database for analysis.
Results and conclusions are pending and will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Describe the current utilization of fondaparinux at The Ohio State University Medical Center.

Understand the rationale behind the use of fondaparinux in patients with heparin induced thrombocytopenia.

Self Assessment Questions:

What is the rationale behind the use of fondaparinux in patients with heparin induced thrombocytopenia?

Based on the results of this study, what recommendation(s) would you make to the P&T Formulary Subcommittee?

DEVELOPMENT AND IMPLEMENTATION OF A LEPIRUDIN DOSING PROTOCOL

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Purpose: Heparin-induced thrombocytopenia (HIT) is a potentially serious adverse reaction to unfractionated heparin therapy. It affects 1-5% of all patients exposed to heparin. HIT has the potential to cause serious thromboembolic complications; therefore it must be treated immediately. Lepirudin is a direct thrombin inhibitor approved for anticoagulation in patients diagnosed with HIT and associated thromboembolic disease. Currently our institution does not have a standardized method of dosing lepirudin. The purpose of this study is to evaluate adherence to the manufacturer's published dosing guidelines and to develop and implement a lepirudin dosing protocol in the ThedaCare Hospital system.

Methods: A retrospective chart review of all patients who received lepirudin therapy at Appleton Medical Center and Theda Clark Medical Center from January 1, 2003 through December 31, 2004 was performed. Variables for review included: reason for admission, allergies, dose, route of administration, baseline laboratory values, reason for anticoagulation, and length of therapy. Patients receiving lepirudin for any other indication than HIT or an associated thromboembolic event were excluded from the study.

Results/Conclusions: Results and conclusions to be presented at the Great Lakes Resident Conference.

Learning Objectives:

Explain the pathophysiology, diagnosis, treatment, and adverse effects of heparin-induced thrombocytopenia.

Discuss the significance of the implementation and adherence to a lepirudin dosing protocol.

Self Assessment Questions:

T/F Heparin-induced thrombocytopenia is an immunologic reaction that can develop with any exposure to heparin.

T/F Patients treated with lepirudin may develop antihirudin antibodies that can enhance the anticoagulant activity of lepirudin.

THE DIFFERENCE IN HEART FAILURE TREATMENT MAXIMIZATION BETWEEN A MULTIDISCIPLINARY HEART FAILURE CLINIC AND STANDARD MEDICAL CARE

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Statement of purpose:
This study will attempt to provide evidence that Congestive Heart Failure (CHF) treatment is maximized more often and target treatment goals are achieved more effectively, when patients are managed in a multidisciplinary clinic involving a physician, pharmacist, and nurse vs. standard medical care.

Statement of methods:
A retrospective one-time chart review was conducted for a random sample of 40 patients in a multidisciplinary heart failure clinic (intervention group) and 80 patients in an Internal Medicine Resident Clinic (control group) with a diagnosis of CHF. The data collection period for each patient was over a minimum 6 months of follow up visits. The primary outcomes of this study were to determine if there was a difference in the percentage of patients on angiotensin converting enzyme inhibitors (ACEI)/angiotensin receptor blockers (ARBs) and beta-blockers; and, if there was a difference in the percentage of patients at target doses of ACEI/ARB and beta-blocker. Target doses are defined by the ACC/AHA guidelines for the evaluation and management of chronic heart failure in the adult. Secondary outcomes included the percentage of patients on other accepted CHF drug therapies including spironolactone, digoxin, hydralazine/isosorbide dinitrate, and diuretics, along with the percentage that received education on weight management, medication compliance, low sodium diets, and smoking cessation. Use of medications with precautions in CHF, such as thiazolidinediones, metformin, non-steroidal anti-inflammatory drugs, oral steroids, diltiazem and verapamil, was assessed. Additionally, laboratory parameters such as lipid levels, blood pressure, hemoglobin A1C, and incidences of hyperkalemia (serum potassium >6) were assessed.

Results and conclusion reached:
Data collection and analysis are currently in process. Results and conclusions regarding the difference between the two populations will be presented at the Great Lakes Residency Conference.

Learning Objectives:

Define a maximized therapy for outpatient management of congestive heart failure.

Describe the therapies proven to decrease mortality in outpatient heart failure patients.

Self Assessment Questions:

Therapeutic option that have been shown to decrease mortality in outpatient heart failure patients include
a. angiotensin converting enzyme inhibitors
b. beta-blockers
c. calcium channel blockers
d. digoxin
e. Both a and b

True or False. Heart failure patients should be titrated to maximum doses of angiotensin converting enzyme inhibitors as tolerated.

IMPLEMENTATION OF DEEP VEIN THROMBOSIS RISK GUIDELINES TO PREVENT VENOUS THROMBOEMBOLISMS IN A COMMUNITY-BASED MULTIHOSPITAL NETWORK.

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INTRODUCTION: The recent release of the seventh ACCP (American College of Chest Physicians) conference guidelines on antithrombotic and thrombolytic therapy strongly recommends that institutions initiate guidelines in their clinical setting to prevent venous thromboembolisms (VTE). Approximately every year, 2 million Americans develop a deep vein thrombosis (DVT) and greater than one-fourth develop a pulmonary embolism. Therefore, implementation of a guideline that identifies patients at risk for a VTE and corresponding prophylaxis is important for proper patient care.

OBJECTIVE: The objective is to implement a guideline that identifies patients at risk for developing a DVT and suggests appropriate prophylaxis.

METHOD: Retrospective, observational, open-labeled, cross-sectional evaluation of DVT prophylaxis and risk stratification of patients in a community hospital setting. All subjects on the medical and surgical floors will be followed during a two week period before and after implementation of the guideline at three community hospitals in the Indianapolis area. The guideline will be put into the charts on a physician order form. Subjects are excluded if they are less than eighteen years old, pregnant, or in the intensive care unit. Patient charts will be reviewed for risk factors for a DVT according to the seventh ACCP guidelines, reason for admission, anticoagulants used (non-pharmacologic therapy, aspirin, low-molecular-weight heparins, heparin, or clopidogrel), contraindications for anticoagulation, and adverse drug reactions as documented by the multi-disciplinary notes or progress notes. Subjects will be classified as high risk, moderated risk, or low risk according to the ACCP guidelines. Further, subjects will be stratified as appropriately treated versus untreated according to the newly implemented guideline. The primary outcome is to determine if the implemented guideline increases the percentage of patients receiving appropriate prophylaxis for DVT. The secondary outcome is to compare the different anticoagulants used for prophylactic treatment.

RESULTS: The results will be presented at the Great Lakes Conference.

Learning Objectives:

Describe the new DVT prophylaxis guidelines according to the seventh ACCP guidelines

Demonstrate the role of a DVT prophylaxis physician order form as a reminder for DVT prophylaxis

Self Assessment Questions:

Aspirin is appropriate therapy for DVT prophylaxis.
(a) True
(b) False

What is the most appropriate dose of heparin for DVT prophylaxis in the high-risk patient category?
(a) Heparin 5,000 units Sub-Q Daily
(b) Heparin 5,000 units Sub-Q q 8 hours
(c) Heparin 5,000 units Sub-Q q 12 hours
(d) Heparin 300 units Sub-Q q 12 hours
(e) Heparin 300 units Sub-Q q 8 hours

IMPLEMENTATION OF A PHARMACIST-BASED INPATIENT WARFARIN EDUCATION SERVICE

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Purpose: At Theda Clark Regional Medical Center, pharmacists do not currently perform inpatient warfarin education. The purpose of this study is to evaluate the impact of a pharmacist-based warfarin education service on patient comprehension of the medication.

Methods: A computerized report was generated which included all patients who were admitted from January 1, 2004 to December 31, 2004 with the principle diagnosis of deep-vein thrombosis, pulmonary embolism, or atrial fibrillation. From this report, a retrospective chart review was conducted to evaluate the patients initiated on warfarin therapy during the hospital admission for deep-vein thrombosis, pulmonary embolism, or atrial fibrillation. An assessment tool will be sent to those patients who were initiated on warfarin therapy during their hospital stay. The purpose of the assessment tool will be to evaluate patient comprehension following nursing-based warfarin education. The data collected will serve as pre-intervention data. The assessment tool will be intended to evaluate the patient's comprehension of warfarin indications, precautions, dosing, adverse reactions, drug and food interactions, and monitoring parameters. In March 2005, the pharmacist-based warfarin education will be initiated on a single unit. The same assessment tool used for evaluation of nursing-based warfarin education in the pre-intervention period will be given to patients following the pharmacist-based warfarin consultation for the purposes of evaluating the pharmacist-based service.

Results and Conclusions will be presented at the conference.

Learning Objectives:

Understand the impact that pharmacist-based warfarin education has on patient comprehension of warfarin indications, precautions, dosing, adverse reactions, drug and food interactions, and monitoring parameters.

Understand the role that proper patient education can play in preventing patient-related medication errors.

Self Assessment Questions:

Identify key components of a thorough warfarin education consultation.

Discuss barriers to implementing a pharmacist-based inpatient warfarin education service.

BEHIND ACADEMIC DISHONESTY IN PHARMACY SCHOOL: EXPLORING CHARACTERISTICS, PREVALENCE, ATTITUDES AND PERCEPTIONS

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Purpose:
Academic dishonesty is a major concern among pharmacy students because of the career these students will embark on in the near future. Previous studies assessed medical and dental students' perceptions on cheating, but few have determined pharmacy students' attitudes. The objectives of this study are to ascertain background factors that influence pharmacy students' willingness to cheat, to determine a relationship between cheating and demographics of pharmacy students, to describe pharmacy students' attitudes and perceptions of different methods of cheating, to assess the prevalence of cheating done or witnessed by pharmacy students and to identify atmospheres that are conducive to cheating.

Methods:
Third professional year Doctor of Pharmacy students at six colleges of pharmacy were administered a survey. The universities were chosen based upon their classifications: private or public and locations: rural, city or suburban. Third year students were selected because they have been in pharmacy school the longest and are more accessible than fourth year students on rotations. The survey is divided into four sections: scenarios, Likert-type scale questions, short statements, and demographic data.

Results:
To date, 264 surveys have been completed. Thirty-three percent of the surveys were completed at private and 67% at public institutions. All sections of the survey will be analyzed using descriptive statistics; the Likert-type scale questions will also be evaluated using factor analysis and reliability.

Conclusion:
Complete results are expected by the end of February and analysis will take place soon thereafter. Results may show attitudes/prevalence of cheating and background factors that influence the willingness to cheat. Results from this study may be used to suggest methods that could possibly decrease cheating among pharmacy students.

Learning Objectives:

To describe a pharmacy student's attitude and perception of different methods of cheating.

To assess the prevalence of cheating committed by pharmacy students.

Self Assessment Questions:

Current studies indicate that over the past thirty years cheating rates have increased and are higher than ever before. T or F

Previous research has shown that students who have cheated in the past are more likely to cheat in pharmacy school. T or F

CLINICAL PHARMACY SERVICES IN COMMUNITY HOSPITALS LOCATED IN THE GREAT LAKES REGION

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Background: The profession of pharmacy has transformed from an occupation focused mainly on the dispensing of medications to a dynamic career with a variety of clinical opportunities. The impact of pharmacists in the clinical arena has yielded positive results for patient care. Drug therapy suggestions made by pharmacists have been associated with a reduction in hospitalizations, emergency room visits, urgent care visits, and length of hospital stays. Studies have demonstrated that a broad range of patient care services provided by pharmacists have resulted in improved disease and drug therapy management, greater patient satisfaction, and enhanced quality of life. However, the current practice of clinical pharmacy in the community setting remains to be defined.

Objective: The objective of this survey is to determine the level of clinical pharmacy services practiced in community hospital located in the Great Lakes region.

Methods: The survey, involving healthcare institutions with 100 to 200 staffed beds, will be distributed to directors of pharmacy in community settings located in Ohio, Illinois, Kentucky, Indiana, Wisconsin, and Michigan. The sample size will be approximately 245 healthcare institutions. The survey questions will be aimed at determining the educational backgrounds of practicing pharmacists, therapeutic protocol initiation and implementation, geographic allocation of personnel, multidisciplinary patient care efforts, patient population parameters, and clinical pharmacy activities. The data will be analyzed with the purpose of providing a summary of pharmacy practices in community hospitals located in the Great Lakes region. The results will assist hospitals in establishing clinical roles for pharmacists so that the benefits discovered in previous studies can be fully realized in the community setting.

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

Learning Objectives:

Identify the extent of clinical or cognitive activities performed by pharmacists at community hospitals in the Great Lakes Region.

Identify where additional clinical pharmacy services in community hospitals may have the greatest potential to positively impact patient care.

Self Assessment Questions:

True or False: Out of all the activities performed by staff pharmacists in community hospitals located in the Great Lakes Region, the majority of activities could be considered clinical or cognitive.

If given the opportunity to expand services, what additional clinical service would be of highest priority for directors of pharmacy in the community setting?

IMPROVING PAIN MANAGEMENT DURING LABOR IN PATIENTS WHO OPT NOT TO HAVE EPIDURAL ANESTHESIA

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Background: ACOG (American College of Obstetricians and Gynecologists) recommends regional anesthesia during labor for pain management due to its superior efficacy compared to systemic analgesia. However, some patients have a contraindication to regional anesthesia and others refuse the method.

Purpose: To assess whether the use of fentanyl patient controlled intravenous analgesia (PCIA) compared to intermittent intravenous (IV) analgesia can improve labor pain control and patient satisfaction in patients who do not wish to use epidural anesthesia.

Methods: This study was submitted to obstetric physicians and anesthesiologists for approval. The use of fentanyl PCIA (loading dose = 50 mcg, dose = 20-25 mcg, lockout interval = 10-15 minutes) will be compared to intermittent IV analgesia (nalbuphine, oxymorphone, fentanyl). Healthy parturients who are 18 years of age or older will be informed about the options for systemic analgesia. Whether or not to use fentanyl PCIA is left up to patients and physicians. Patients' age, ethnicity, and parity will be obtained as demographic data to match the patients in the two groups. Confidentiality of patient data will be maintained. Patients will be asked to rate pain intensity (pain analog scale of 0-10, 0 having no pain to 10 having worst pain). Information on side effects (sedation, nausea, vomiting), respiratory status, and total dose of analgesic used will be collected. The number of patients crossing over to epidural anesthesia from systemic analgesia will be counted for assessment of efficacy. Apgar score at 1 and 5 minutes and naloxone use in infants will be collected for assessment of safety. A patient satisfaction survey will also be conducted before discharge, which includes pain rating (visual analog pain scores).

Results: All the data will be evaluated to assess the efficacy and safety of fentanyl PCIA as compared to other systemic analgesia regimens, as well as its correlation to patient satisfaction.

Learning Objectives:

Discuss the process of implementing a study and the analysis of collected data (pain rating scale, patient satisfaction survey) during the study.

Assess if the use of fentanyl PCIA is an effective and safe alternative to intermittent IV analgesia.

Self Assessment Questions:

T or F: The use of fentanyl PCIA improves pain management, which leads to better patient satisfaction.

T or F: The use of fentanyl PCIA provides patients a sense of control regarding management of labor pain, which helps to improve patient satisfaction.

NUTRITIONAL SUPPORT IN ACUTE CARE PATIENTS POST VENTRICULAR ASSIST DEVICE PATIENTS PLACEMENT.

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Patients with severe congestive heart failure (CHF) often have minimal ambulatory capabilities and a poor nutrition status due to their compromised cardiac function. The condition “cardiac cachexia” is common in these patients and can be attributed to malabsorption, hypermetabolic states and impaired nutrient and oxygen delivery. Malnutrition compromises immunological function, impairs respiratory function and increases the risk of infections. Ventricular Assist Devices (VADs) are implanted in patients with severe CHF to improve myocardial tissue perfusion while they await open-heart surgery or heart transplants and in the recovery of these events. After VAD placement, patients with a history of cardiac cachexia may need nutritional support in order to promote a successful recovery. Recent studies on nutritional supplementation indicate that enteral nutrition is associated with improved outcomes compared to parenteral nutrition. However, many clinicians avoid enteral feeding in patients due to concerns of gut ischemia associated with decreased cardiac outputs. The specific aim for this study is to determine the most appropriate and beneficial nutritional support for patients in the acute phase post-VAD placement.

This study is a retrospective chart review, which assesses the nutrition support, both parenteral and enteral feedings, in acute care patients directly after VAD placement. The acute care phase is defined as the first 7 to 10 days post VAD placement. Results from 41 patients include those who were between 18 and 65 years of age and received a VAD between 1992 and 2004 at Methodist Hospital or Indiana University Hospital. Nutrition support will be evaluated based upon route of delivery, the amount of calories and protein tolerated, and nutritional complications. Clinical outcomes will be assessed and include hepatic, renal and pulmonary function, hyperglycemia, ventilator days, intensive care unit length of stay (LOS) hospital LOS, and survival at 28 days.

Learning Objectives:

Relate nutritional support tolerance to underlying cardiovascular function.

Describe the characteristics of and tolerance of nutritional support regimens in patients following VAD placement.

Self Assessment Questions:

T or F VADs provide cardiac support to patients who cannot maintain adequate blood pressure.

T or F Heart failure and cardiomyopathies are a common cause of malnutrition.

ASSESSMENT OF SECOND-GENERATION ANTIPSYCHOTIC AGENTS AND HALOPERIDOL ON THE DEVELOPMENT OF ADVERSE METABOLIC CONSEQUENCES AMONG SCHIZOPHRENIC PATIENTS

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Purpose: To determine the prevalence and correlate the development of type 2 diabetes, pre-diabetes, and the metabolic syndrome among schizophrenic patients treated with second-generation antipsychotics or haloperidol at a veterans affairs medical center and to evaluate the appropriate monitoring of antipsychotic therapy.

Methods: 240 patients with a diagnosis of schizophrenia currently receiving second-generation antipsychotics and/or haloperidol were randomly selected for review from computerized pharmacy records. A retrospective chart review was conducted to assess the presence of adverse metabolic consequences in these patients. The following data was collected from the patient's electronic medical records: patient demographics, risk factor assessment for cardiovascular disease and metabolic syndrome, second-generation antipsychotic (or haloperidol) utilized, baseline and current fasting blood glucose, lipid, and A1C values.

Preliminary Results: Data has been collected on 158 patients. At baseline, 48 (32.2%) patients were deemed overweight compared with 49 (32.7%) patients at endpoint, and 60 (40.3%) patients were deemed obese compared with 68 (45.3%) at endpoint. There was a statistically significant increase in body weight from a baseline average of 89.6 ± 42.5 kg. to an endpoint average of 91.3 ± 18.7 kg. (p= 0.038). 15.8% of patients met the criteria for pre-diabetes, 22.8% had a diagnosis of diabetes, and 37.3% met the criteria for metabolic syndrome. The most frequently prescribed second-generation antipsychotic was risperidone (32.9%) followed by olanzapine (28.6%).

Preliminary Conclusions: A statistically significant increase in body weight was seen from baseline to endpoint in the patients receiving second-generation antipsychotics (p=0.038). 59% of the patients currently taking second-generation antipsychotics fulfill the criteria for the diagnosis of metabolic syndrome. Many of the patients were not monitored appropriately when initiating and changing from one agent to another. A protocol is needed to guide physicians when starting, titrating, and monitoring their patients on second-generation antipsychotic agents.

Learning Objectives:

List three key monitoring parameters for patients receiving second-generation antipsychotic agents.

State what information needs to be included when developing a protocol for monitoring patients receiving second-generation antipsychotic agents

Self Assessment Questions:

True or False. All second-generation antipsychotic agents equally affect a patient's weight.

True or False. Metabolic parameters need to be assessed weekly after initiating or changing second-generation antipsychotic therapy.

A CONSULTATION-INTEGRATED DIABETES MANAGEMENT PROGRAM IN A COMMUNITY PHARMACY SETTING

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Objectives: The purpose of a consultation-integrated diabetes education program in the community pharmacy setting is to further the knowledge of our diabetic patients regarding their disease state and the importance of proper treatment as well as renew interest in their diabetes management and update them on recent guidelines. In addition, the program focuses on educating patients on the recommended guidelines and standards of care. The broad goals of the program are to raise the level of service provided by pharmacists, increase patient expectation of the interaction with pharmacists, and increase pharmacist satisfaction regarding the use of their professional skills in the community setting.

Methods: The diabetes management program outlines twelve areas of diabetic care including: blood glucose monitoring, A1C testing, hypoglycemia, renal health, blood pressure management, cholesterol control, diet and exercise, foot care, eye health, aspirin and ACE-Inhibitor therapy, smoking cessation, and sick day management. Educational brochures were created for each topic for pharmacists to use as an educational tool as well as provide literature for patients to refer to at home. The program is integrated into work flow by using our dispensing software to prompt which topic. The pharmacist discusses a different area with the patient each month and records the information gathered in the computer system. A report generated by the computer software is used to identify outcomes.

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

Learning Objectives:

Identify methods to integrate diabetic consultation into a community pharmacy workflow.

List key areas of diabetic health and care that a pharmacist can discuss with patients beyond their medication utilization.

Self Assessment Questions:

True or False: Community pharmacists are able to focus on non-drug health related items.

True or False: Having written literature to distribute to patients prevents pharmacists from further discussing diabetic care.

EFFECTS OF THE ALLHAT AND JNC-VII ON HYDROCHLOROTHIAZIDE PRESCRIBING IN AN OUTPATIENT RESIDENT CLINIC

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Results of the ALLHAT, a landmark antihypertensive trial, demonstrated that thiazide-type diuretics are as or more effective at lowering blood pressure and reducing clinical events compared to other antihypertensive agents. Based on the outcomes of the ALLHAT, JNC-VI was revised to recommend thiazide-type diuretics as first-line agents for the treatment of uncomplicated hypertension. The purpose of this study was to assess the effect of the ALLHAT and JNC-VII on prescribing practices for the treatment of hypertension.

This was a retrospective chart review of patients with diagnosed hypertension treated at the William Beaumont Hospital Outpatient Clinic. Potential participants for the study were identified using an ICD-9 code for hypertension (401.9). Thiazide-type diuretic prescribing rates were compared during two five-month time periods, pre- and post-ALLHAT publication. Prescribing rates pre- and post-JNC-VII were also compared. Men and women at least 18 years of age with diagnosed hypertension were included in the study. Patients with a documented sulfa allergy, gout, or renal disease were excluded.

The results and conclusions of this study will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

List the major outcomes of the ALLHAT (Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial).

Discuss recommendations of the most recent publication of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC-VII) guidelines in terms of goal blood pressure and drug therapy.

Self Assessment Questions:

In the ALLHAT, the calcium-channel blocker arm and the ACE-inhibitor arm of the study were not superior to the thiazide-diuretic arm in preventing major coronary events or in increasing survival. True or False.

What are the blood pressure goals according to the JNC-VII guidelines for patients with or without diabetes or chronic kidney disease?

THE EFFECTS OF A PHARMACIST COUNSELING PROGRAM ON USE OF DIETARY SUPPLEMENTS

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Statement of Purpose: To determine if a pharmacist counseling program will increase the purchase and use of dietary supplements.

Methods: The computer database of an independent pharmacy consisting of three stores in Northern Kentucky will be used to select patients taking the following prescription medications: SERMs, bisphosphonates, oral hypoglycemics, and/or anti-convulsants. Participants will be assigned to the study or control group depending on which pharmacy they use. Study pharmacists will attend educational sessions on dietary supplements and workflow modifications will be made at the study pharmacies. The study group will receive educational materials by mail and during counseling sessions with pharmacists. Data collected will include (1) vitamin sales before and after educational program and workflow modifications (2) patient surveys assessing supplement use and pharmacist influence (3) pharmacist survey on supplement sales.

Results: Sales data will be compared between the control and study pharmacies to determine if sales of the selected dietary supplements increased at the study pharmacies. Survey results will be used to evaluate the pharmacists' influence on supplement use and thoughts on supplement sales.

Conclusions: This project is expected to demonstrate a unique counseling program on dietary supplementation that requires minimal time, improves patient care, and generates adequate revenue from increased pharmacy sales.

Learning Objectives:

Describe an over-the-counter counseling program.

Discuss several factors that contribute to increased dietary supplement use and sales.

Self Assessment Questions:

True or False Dietary supplement use and sales can be increased by providing a counseling program to both pharmacists and patients.

Which methods are most effective when promoting dietary supplements?
a. Patient counseling with patient education sheets
b. Mailing of patient education materials
c. Providing incentives (i.e. coupons)

THE EFFECTS OF NUTRITION ON SERUM GLUCOSE CONCENTRATIONS IN HEAD INJURED PATIENTS

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Head injury is complicated by both ischemic insult and increased sympathetic tone. Nutritional support plays an important role in the recovery of the catabolic head injury patients and assists in the prevention of head injury complications. Recent emphasis has been placed on glucose control in the surgical intensive care unit (ICU). Glycemic control decreases morbidity and mortality in this patient population. The relationship between nutritional support, incidence of hyperglycemia, and outcomes of head injured patients is not well studied. This retrospective study was performed to evaluate nutrition, blood glucose levels, and patient outcome in closed head injury patients.

Patients with closed head injury admitted to Methodist Hospital between January 2004 and December 2004 were evaluated for study inclusion. Those between the ages of 18 to 80 years, diagnosed with a subarachnoid hemorrhage or a closed head injury without hemorrhage, and admitted to intensive care were included. Patients were evaluated in two groups; subarachnoid hemorrhage or closed head injury without hemorrhage. Data was obtained from the medical charts of 180 subjects and included the type and site of nutritional support, amount of time requiring nutritional support, daily caloric and protein intake, mechanical ventilation, vasopressor use, Glascow Coma Score, number of organ failures, vital signs, albumin, pre-albumin, APACHE II score, daily insulin requirements, steroid use, blood glucose concentrations, medications, infections, and other complications. The primary outcome measure was nutritional intake and length of ICU and hospital stay. Secondary outcome measures included the correlation between serum glucose concentrations and the amount and type of nutrition consumed.

Learning Objectives:

Identify potential causes of hyperglycemia in the critically ill patient.

Describe the potential adverse effects of uncontrolled hyperglycemia in the critically ill.

Self Assessment Questions:

T/F Nutritional support does not contribute to the incidence of hyperglycemia.

Can complications of critical illness alter glucose production and cellular uptake?

IMPLEMENTATION OF AN INTERVENTION TOOL TO INCREASE PATIENT-PHARMACIST INTERACTIONS REGARDING HERBAL MEDICATIONS

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Objective: The objective of this study was to investigate the effect of an intervention, consisting of a documentation tool and an educational program, on the frequency of pharmacist interactions with patients about herbal medicines (HM). We also evaluated the effect of this intervention on pharmacist knowledge of HM, and on pharmacist confidence with HM counseling.

Methods: Albertson's pharmacists in Chicago and Indianapolis attended an educational program on HM. Pharmacist knowledge of HM was compared before and after the educational program via a quiz. Pharmacists were instructed to use a tool for communicating with patients about HM. Following the educational program, pharmacists all patients presenting to the pharmacy for prescriptions would be asked to record HM they were taking and why. The pharmacists were then to provide appropriate counseling and document use of HM and/or recommendations in the patient profile and on the tool. The impact of the documentation tool on the frequency of pharmacist interactions with patients about HM was assessed using a pre- and post-intervention questionnaire. The questionnaire assessed pharmacist confidence in counseling patients about HM and their opinions of the effectiveness of the tool. It also asked them to report the frequency of interactions with patients on HM. The follow-up assessment was conducted 3 months after the educational program to determine the level of self-perceived knowledge and confidence retained over time.

Results: Demographic characteristics of the pharmacists who participated in the program will be described. The average score on the pre-CE quiz was 71.6%; after the CE, the average quiz score was 92.5%. This difference was statistically significant ($p<0.05$). Results of frequency of interventions and pharmacist confidence will be described.

Conclusions: Pharmacists attending the education program on HM became more knowledgeable. This educational program and the accompanying tool may be of value to others who wish to implement similar programs targeting HMs.

Learning Objectives:

Discuss how increased knowledge and confidence in herbal counseling can increase pharmacist and patient interactions on herbal medications.

Identify barriers associated with the use of an herbal assessment form.

Self Assessment Questions:

What was the average percentage increase in herbal quiz scores before and immediately after the CE program?

List 2 barriers associated with the use of an herbal assessment form.

EVALUATION OF DIETARY SUPPLEMENT USE IN AN AMBULATORY VETERAN POPULATION

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According to the Dietary Supplement Health and Education Act of 1994 (DSHEA), a dietary supplement is a product taken by mouth that contains a “dietary ingredient” intended to supplement the diet. These “dietary ingredients” may include: vitamins, minerals, herbs or other botanicals, amino acids, and substances such as enzymes, organ tissues, glandulars and metabolites. The number of patients using both prescription medications and dietary supplements is steadily increasing. Concurrent use can lead to potential adverse interactions. Currently, those who report the combined use to their primary care provider still remain low.

The objective of this study is to determine the prevalence of dietary supplement use in an ambulatory veteran population. Secondary objectives include the number and type of supplement used, provider documentation of use, and potential drug-herbal interactions.

Patients will be recruited to participate in a survey highlighting commonly used dietary supplements. Eligible patients include those who obtain prescriptions through the outpatient pharmacy or the VA mail order processing center and who report the use of at least one dietary supplement. It is anticipated that one hundred patients will be surveyed. Along with completing the survey patients will also be asked if supplement use was instructed by a provider or self-prescribed. The electronic medical chart will be used to identify provider documentation of use within the past year. In addition, the current active medication profile will be screened for potential drug-herbal interactions using two standard references. Data collected will be added to the patient's electronic chart.

Data collection is ongoing at this time. Results will be analyzed and presented at the Great Lakes Residency Conference.

Learning Objectives:

Identify what constitutes a dietary ingredient as defined by DSHEA.

Understand the importance of documenting the use of dietary supplements in the patient's medical record.

Self Assessment Questions:

What constitutes a “dietary ingredient” as defined by DHSEA?
A. Organ Tissue
B. Vitamins
C. Minerals
D. B&C
E. All of the Above

(T/F) The percentage of Americans using both prescription medications and dietary supplements to treat chronic medical conditions is on the decline?

EVALUATION OF THE PHARMACOKINETICS OF VORICONAZOLE

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Background: The pharmacokinetics of voriconazole in initial clinical trials has been well documented as significantly meeting or exceeding minimum inhibitory concentrations (MIC) for all major fungal pathogens. Limited data exists on the pharmacokinetics of voriconazole in immunocompromised patients, and there has been little to no investigation of the pharmacokinetics in patients with the potential for fungal infections. The concomitant disease states and medications in critically ill patients with invasive fungal infections could have an impact on the pharmacokinetics.

Objective: The aim of this study is to investigate the pharmacokinetics of voriconazole following the administration of oral tablets, oral suspension, and IV infusion therapy in patients with a documented, suspected, or prophylaxis for fungal infection

Methods: The patients receiving voriconazole will be selected and included in this study for data collection. Subjects must be 18 years of age or older with a documented, suspected, or prophylaxis for fungal infection. Subjects will be excluded if they are less than 18 years of age, denied consent, or prescribed medications with absolute to relative contraindications including cisapride, pimozide, quinidine, barbiturates, carbamazepine, ergot alkaloids, rifampin, and sirolimus. Voriconazole levels will be monitored with blood sample analysis. Samples will be collected starting 3 days after beginning voriconazole therapy to achieve steady state concentrations before analysis. Blood samples will be drawn at 30, 60, 90, 120 minutes, and 3, 4, 6, 8, 10, 12 hours post administration. The blood samples will be sent to an in-hospital lab for analysis using the WinNONLin pharmacokinetic monitoring program. The area under the curve (AUC) of voriconazole blood levels in these patients will be the primary variable for monitoring the pharmacokinetics.

Results: Data collection is currently ongoing. Results will be presented.

Learning Objectives:

Understand the current spectrum of activity of voriconazole in comparison to other antifungals.

Identify the patient populations and other factors in which the pharmacokinetics of voriconazole could potentially be altered.

Self Assessment Questions:

(T/F) Intravenous voriconazole should be avoided in patients with a creatinine clearance less than 50 ml/min due to the accumulation of the intravenous vehicle (SBECD).

(T/F) Voriconazole has the widest spectrum of activity in comparison to all other antifungal agents.

COMPARISON OF PREDICTED CREATININE CLEARANCE TO MEASURED (ACTUAL) CREATININE CLEARANCE IN MORBIDLY OBESE PATIENTS UNDERGOING LAPAROSCOPIC GASTRIC BYPASS SURGERY

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Purpose: To determine if a difference exists between estimated creatinine clearance and measured (actual) creatinine clearance in morbidly obese patients.

Methodology: All patients undergoing laproscopic gastric bypass surgery at Gundersen Lutheran Medical Center between October 15, 2004 and March 15, 2005, will be screened for inclusion in this study. The study will include male and female patients that are at least 18 years of age and have a body mass index (BMI= weight (kg)/[height (m)]2) greater than 35. Serum creatinine will be obtained pre-operatively on all patients. If the initial serum creatinine is greater 2.5 mg/dL, the patient will be excluded from the study. Patients participating in this procedure are routinely catheterized post-operatively, which facilitates determination of a urine creatinine clearance. After the urine collection is complete, a second serum creatinine will be drawn for comparison to the first. If the two serum creatinine levels differ by greater than 20 percent, the patient will be considered to have unstable renal function and will be excluded from the study. Once all of the above data is collected, the measured creatinine clearance will be compared to the estimated creatinine clearance using the Cockcroft-Gault equation and the Salazar-Corcoran equation. The creatinine clearance will also be compared to modified Cockcroft-Gault equations by substituting ideal body weight (IBW(males) = 50 + 2.3[height (in.) – 60 in] IBW(females) = 45.5 + [height (in) – 60 in]) for actual body weight (DW= IBW + 0.4(ABW-IBW)) for actual body weight. The data will be analyzed using ANOVA with Bonferroni corrections. Spearman correlations will also be performed.

Data collection is currently in progress. Analysis of results is pending.

Learning Objectives:

Describe the patient populations that were used to derive common equations for predicting creatinine clearance.

List factors that may alter a patient's creatinine clearance (predicted or measured).

Self Assessment Questions:

What are the limitations to performing an actual measurement of a patient's creatinine clearance?

Which equation was specifically designed to assess creatinine clearance in obese patients?

AN EVALUATION OF ENOXAPARIN DOSING IN PERSONS WITH RENAL INSUFFICIENCY

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Purpose: The enoxaparin product package insert currently recommends extending the dosing interval from 1 mg/kg every 12 hours to 1 mg/kg every 24 hours for use in persons with creatinine clearances < 30ml/min. Data to support this is rather sparse. It has been suggested that extending the dosing interval to 24 hours may not provide sufficient anticoagulation for the entire 24 hour period. The purpose of this study is to determine the appropriateness of the extended dosing interval recommendation through monitoring Anti-Factor Xa levels in persons with renal insufficiency.

Methods: The pharmacy department's computer system will identify eligible subjects by producing a daily report of patients receiving enoxaparin in the medical center. Subjects younger than 18 years of age and those greater than 40% of their ideal body weight will be excluded from the study. Subjects receiving enoxaparin at treatment doses, who are at steady state, and with a creatinine clearance less than 50 ml/min, will be included in this trial. Three groups will be analyzed in this study: those with a CrCl between 31 – 50 ml/min receiving enoxaparin at 1 mg/kg every 12 hours, those with a CrCl between 20 - 30 ml/min receiving enoxaparin at 1 mg/kg every 24 hours, and those with a CrCl between 5 – 19 ml/min receiving enoxaparin at 1 mg/kg every 24 hours. Both peak and trough Anti-Factor Xa levels will be monitored in groups receiving the 12 hour dosing regimen. For subjects with CrCl less than 30 ml/min, peak, 12 hour post dose, and trough Anti-Factor Xa levels will be collected. In addition to analyzing the Anti-Factor Xa levels, a correlating Anti-Factor Xa clearance rate will be calculated to determine the impact renal impairment has on the clearance of enoxaparin.

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

Learning Objectives:

Identify patients who may be candidates for full dose (1 mg/kg) anticoagulation with a 24 hour dosing interval.

Appreciate the correlation of Anti-Factor Xa levels and renal impairment, if any.

Self Assessment Questions:

Renal impairment completely precludes the use of enoxaparin. True or False

Peak plasma Anti-Factor Xa activity occurs about 3 to 5 hours post dose. True or False

ASSESSMENT OF PHARMACIST UNDERSTANDING AND PERFORMANCE RELATED TO DRUG USE POLICIES AND SAFETY PRACTICES

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P& T committees develop hospital guidelines to assist practitioners in making decisions about appropriate and safe use of medications. As drug therapy has become increasingly complex, the number of medications with specific drug use policies imposed by the P&T committee has increased. This has raised concern as to whether pharmacists are adequately informed regarding these regulations and whether they consistently carry out the intent of these policies. Extrapolating from the high percentage of non-adherence by physicians with clinical practice guidelines, the question of pharmacists' adherence with P& T committees' drug use policies is raised.

The objectives of the study are to determine the degree to which pharmacists are able to recognize order scenarios for drugs with safety concerns or with specific drug use policies that require intervention, and the degree to which pharmacists are able to identify the appropriate actions to be implemented in these situations. The results of this assessment will be used to identify areas of non-adherence, the barriers to adherence, to develop educational programs and implement system changes to improve pharmacists' performance.

The project utilizes simulation testing. A panel of medication orders was developed; some requiring specific intervention by the pharmacist and some requiring no special action. These orders will be processed using the institution's pharmacy information system with all current alerts and reference materials available. Time pressure will be used to simulate actual practice. Pharmacists will be asked to process all the orders and to indicate when any specific intervention is necessary and to identify the appropriate action. Performance will be assessed against current restrictions and drug use policies. Data will be analyzed by pharmacist location, regular shift, years of service, and by types of interventions. An analysis of factors leading to compliance with guidelines will also be conducted.

Learning Objectives:

Determine the degree to which pharmacists are able to recognize orders encountered for drugs with safety concerns or with specific drug use policies that require intervention.

Determine the degree to which pharmacists are able to identify the appropriate actions to be implemented for these drugs.

Self Assessment Questions:

To what degree were pharmacists able to recognize orders that required specific interventions and to identify the appropriate actions to be implemented for these drugs?
a. <10%
b. 10-20%
c. 20-50%
d. 50-75%
e. >75%

What are the barriers to adherence identified in this project?
a. Lack of awareness of guidelines
b. Alert fatigue
c. Lack of perceived importance of guidelines
d. Ambiguity regarding responsibility for action
e. All of the above

EXTERNAL BENCHMARKING AND PRODUCTIVITY MONITORING: STANDARDS FOR A HEALTH SYSTEM PHARMACY DEPARTMENT

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The development of accurate and meaningful pharmacy department external cost and productivity monitoring standards using a commercially available benchmarking software system will be described. First, a nationwide survey to pharmacy managers on current use of productivity monitoring systems was completed via the American Society of Health System Pharmacist Manager's listserv. Second, characteristic survey responses as submitted by participating pharmacy departments were matched to host hospital responses in terms of services provided and intensity of patients cared for. A preliminary list of similar peer hospitals was constructed. A telephone survey of the directors of pharmacy at the identified peer institutions was conducted to assess the extent to which best practices for managing drug utilization and maximizing patient safety were implemented within their organizations. The preliminary peer list was then narrowed down to represent a smaller, more consistent peer group. Third, data integrity and reporting flaws were systematically identified within the vendor's benchmarking software system. Fourth, cost and productivity metrics (key indicators) are in the process of being selected to measure the effectiveness of host pharmacy services versus the peer group. An ongoing system for monitoring and explaining key indicator variances will be implemented in collaboration with hospital administration. Host key indicator performance will be monitored versus the comparator peer group on a quarterly basis in tabular and graphical format to track host performance improvement over time.

Results:
Challenges in working with commercially available benchmarking systems are numerous. These challenges, as well as the results of this project will be presented.

Conclusions:
An efficient external cost and labor productivity monitoring system was developed to measure pharmacy department performance over time versus a meaningful comparative peer group, and to support the overall value of pharmacist patient care services.

Learning Objectives:

Describe value of commercially avaialble benchmarking and productivity monitoring systems and explain at least three flaws related to their use.

Understand key indicators and the selection of a meaningful peer group for effectively monitoring labor efficiency, supply and operating expenses.

Self Assessment Questions:

Which of the following key indicators is most encompassing of overall pharmacy financial performance?
a. Drug expense per 100 pharmacy intensity adjusted department adjusted patient days.
b. Total pharmacy expense per 100 pharmacy intensity adjusted department adjusted discharges.
c. Pharmacy labor expense per 100 case mix index adjusted department adjusted discharges.

Pharmacy department peer groups should be selected solely on the basis of participating institution's responses to benchmarking vendor software characteristics survey questions?
a. True
b. False

EFFECT OF A SMOKING CESSATION EDUCATIONAL PROGRAM ON CHANGING KNOWLEDGE, ATTITUDES, AND BEHAVIORS OF PRIMARY CARE PRACTITIONERS

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Purpose: The objective was to evaluate a pharmacist-based smoking cessation detailing program. To accomplish this objective, we tested the effectiveness of the program to: 1) increase knowledge, change behaviors, and modify attitudes of practitioners compared to a control group; 2) recruit patients into a community pharmacy-based smoking cessation program, and 3) increase the number of nicotine replacement products sold.

Methods: Six primary care practices were selected to participate. Three practice sites received a pharmacist-based detailing program (intervention) while the other three practice sites served as a control group. A baseline survey was administered to all practitioners at the six sites. The survey assessed knowledge, attitudes, and behaviors concerning smoking cessation. Following the baseline survey, a three-phase detailing program was provided at the intervention practices. One month following completion of the detailing program, a follow-up survey was administered to all practitioners at each site. Patient referrals into a community pharmacy-based smoking cessation program were tracked from control and non-control practices for the time during the detailing program and for one month following the program. Nicotine replacement therapy (NRT) sales were tabulated for three months during the detailing program and for a similar three month period from the prior year. A paired samples t-test will be used to compare within group responses before and after the detailing program concerning knowledge, attitudes, and behavior outcomes. The student's t-test will be used to compare the number of patient referrals from the intervention versus control sites and to compare NRT sales between two time periods.

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

Conclusion: We expect that the detailing program will have a greater impact on knowledge, attitudes, and behaviors when compared with the control practices.

Learning Objectives:

Understand aspects of the current Smoking Cessation guidelines.

Determine the role of pharmacists in Smoking Cessation counseling.

Self Assessment Questions:

The 5 A's of Smoking Cessation are ask, advise, assess, assist, and arrange. T or F

Pharmacists are one of the least accessible health care professionals, thus do not play a part in Smoking Cessation counseling. T or F

OUTCOMES ASSOCIATED WITH THE REPORT OF LINEZOLID INTERMEDIATE VANCOMYCIN RESISTANT ENTEROCOCCUS-DANGERS WITH INAPPROPRIATE CLASSIFICATION?

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Introduction:
Vancomycin resistant enterococci (VRE) continue to plague clinicians in recent years. Historically vancomycin resistant isolates of Enterococcus spp. exhibited unfavorable susceptibility profiles which did not allow the effective dosing of conventional agents. Daptomycin, linezolid, and quinupristin-dalfopristin were developed for resistant gram positive infections. Linezolid remains a popular choice among previously mentioned therapies for ampicillin-insensitive VRE secondary to a favorable pharmacokinetic distribution, a low incidence of adverse effects, oral bioavailability, and FDA-approved indications.

Linezolid resistance has been attributed to the single point mutation G2576T. Recently, a four-fold increase of linezolid resistant VRE was noted at NMH. This finding prompted an outbreak investigation (phase one of the study), and data suggested that variability in laboratory measurement may have been responsible.

Purpose:
The clinical consequences of incorrectly classifying linezolid resistance are unknown. Phase two of the study assessed clinical outcomes and hospital resource utilization associated with the report of linezolid intermediate VRE.

Methods:
A retrospective, case-control study was conducted. An epidemiology report was used to identify patients with clinical isolates of linezolid intermediate VRE from January 1, 2004 to August 30, 2004. Cases were compared to control patients with linezolid sensitive clinical isolates matched based upon site of infection, vancomycin-resistant Enterococcus species, and six month-time period. The following variables were analyzed: demographics, transplant status, Charlson comorbidity score, time elapsed prior to VRE isolation, duration of VRE infection, time elapsed prior to VRE susceptibility was reported, duration of hospital stay, antibiotic selection, adverse drug reactions associated with VRE therapy, nosocomial infections post VRE isolation, number of invasive procedures/tests related to the VRE infection, transfer to ICU, discharge location, and in-hospital mortality.

Results/Conclusions:
In patients with reported linezolid intermediate VRE, it is anticipated that there will be less favorable outcomes and increased utilization of hospital resources. Results will be presented.

Learning Objectives:

1. Pharmacists should have a working knowledge of the resistance mechanism employed by VRE against linezolid.

2. Pharmacists should be able to identify the methodology utilized for defining linezolid susceptibilities to VRE at their institution.

Self Assessment Questions:

1. VRE develop resistance to linezolid through which of the following:
a. Point mutation
b. Efflux pumps
c. Altered porin channels
d. Linezolid resistance in VRE has not been described
e. More than one of the above

2. True or False: Reports document that intermediate resistance to linezolid is easily overcome clinically.

DEVELOPMENT OF COMMON OUTPATIENT CARE PATHWAY FOR ACUTE OTITIS MEDIA

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Objective:
Acute otitis media (AOM) is the leading infection for which antibiotics are prescribed for children in the United States. The American Academy of Pediatrics and American Academy of Family Physicians recently published evidence-based guidelines for diagnosis and management of children 2 months to 12 years of age with uncomplicated AOM. Important issues in management of AOM include identification of patients that require antibiotics and selection of appropriate antibiotics. The purpose of this project is to improve Gundersen Lutheran Health System management of AOM by enhancing compliance with the 2004 AAP/AAFP guidelines.
Methodology:
A list of patients 12 years of age and younger, with the diagnosis of acute otitis media, who were seen in urgent care or the emergency center between October 1, 2003 and March 31, 2004 was first identified. Fifty patients from the generated list were randomly selected, and their medical records were retrospectively reviewed. The following data was collected: patient age, weight, medication allergies, pertinent past medical history, signs and symptoms leading to diagnosis, medications prescribed for symptomatic treatment, and medications prescribed for treatment of infection. Medication prescribing patterns based on available patient data were evaluated and compared to the guidelines to help assess need for development of a protocol/pathway for AOM.
Results:
Analysis of data for the 50 patients revealed a total of 92 errors in following AAP/AAFP guidelines for diagnosis and treatment of AOM, resulting in an average of 1.84 errors per patient. Of the 92 errors, the most frequently occurring was underdosing of antibiotics (39.1%). Other errors discovered include: unclear diagnosis (9.8%), pain not treated (3.3%), prescribing antibiotics for patients that meet observation criteria (22.8%), selecting wrong antibiotic (17.4%), not prescribing antibiotics for patients that don't meet observation criteria (1.1%), and prescribing antibiotics for a less than optimal duration of time (6.5%).

Learning Objectives:

Discuss current AAP/AAFP guidelines for treatment of acute otitis media in pediatric patients.

Understand antibiotic choice and associated dosing for acute otitis media.

Self Assessment Questions:

What are the patient criteria for observation (no antibiotic treatment) with symptomatic treatment for AOM?

What is the first-line antibiotic agent for mild to moderate AOM if no allergic contraindication exists? What is the recommended dosing?

EFFECT OF LONG-TERM THIAZOLIDINEDIONE THERAPY ON EJECTION FRACTION IN PATIENTS WITH HEART FAILURE.

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Thiazolidinediones (TZDs) are a class of medications used to increase insulin sensitivity in patients with type 2 diabetes mellitus. Additional effects of TZDs on blood pressure, inflammatory markers, endothelial function, and lipid profiles suggest a benefit to patients with heart failure. The adverse effect of fluid retention associated with TZDs has prompted a contraindication for NYHA class III and IV heart failure. The primary objective of this study is to evaluate the effect of TZDs on ejection fraction in patients with the concurrent diagnoses of type II diabetes mellitus and heart failure. Secondary objectives measure the effect of TZDs on weight, diuretics, and number of hospital admissions.

Patients were identified from The Heart Failure and Transplant Services clinic database. Patients with diagnoses of both type 2 diabetes and heart failure were retained. Patients were excluded if they were referred to clinic after January 1, 2003, if they did not have two echocardiogram results reported in the appropriate timeframes, or if TZDs were interrupted for more than one month during the study time frame. Patients were stratified into three groups based on their diabetes treatment (1) patients on TZDs, (2) patients on metformin or insulin secretagogues but not on TZDs, or (3) patients on insulin only. Other data collected included demographics, A1c, body mass index, and beta blocker and ACE inhibitor. TZDs effect of ejection fraction is defined by the change baseline measured echocardiogram closest to January 1, 2003 to the echocardiogram measured at least one year after the baseline ejection fraction. Secondary outcomes will be gathered from notes written on the clinic visit closest to baseline and endpoint echocardiogram.

Results will be presented at the Great Lakes Conference.

Learning Objectives:

List potential risks and benefits to heart failure in diabetic patients treated with TZD's.

Define the effect of TZD's on ejection fraction in heart failure patients with diabetes.

Self Assessment Questions:

True or False Thiazolidinediones are contraindicated for use in patients with NYHA class III and IV heart failure.

Thiazolidinediones are shown to have _____ long-term effect on ejection fraction of patients with heart failure.

A. a beneficial
B. a detrimental
C. No

EVALUATION OF THE MANAGEMENT OF SUPRATHERAPEUTIC INR IN A VETERANS AFFAIRS MEDICAL CENTER

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The American College of Chest Physicians (ACCP) has published guidelines for the management of vitamin K antagonists with the intent to offer healthcare providers steps to lower supratherapeutic INR and thereby alleviate the risk of bleeding associated with elevated INR. The primary purpose of this study is to describe the practice patterns for the treatment of elevated INR resultant from oral warfarin therapy at a veterans affairs medical center. The secondary purpose is to compare the practice patterns for the treatment of elevated INR resultant from oral warfarin therapy to the 2001 consensus guidelines of the ACCP regarding the treatment of supratherapeutic INR.

Study patients were identified using a generated laboratory report for patients with INR greater than 5.0 from July 1, 2003 to July 31, 2004. Data collected from patient records included patient demographics, warfarin indication, goal INR, warfarin dose, duration of therapy, treatment of elevated INR, subsequent INR values, presence or absence of bleeding and outcome. Ninety-six patients were identified as having one or more INR result greater than 5.0. Eleven patients, thus far, have been identified as having received at least one order for vitamin K by the oral, subcutaneous, or intravenous route.

In September 2004, the ACCP published updated guidelines on the management of vitamin K antagonists. Due to the retrospective nature of this study, the 2001 guidelines were utilized. Results of this study will determine areas of non-adherence in which the 2004 guidelines may be compared and instituted.

Data collection and analysis is anticipated to be complete by April 2005.

Learning Objectives:

Identify common areas of non-adherence with ACCP guidelines for the management of nontherapeutic INRs.

Propose methods by which pharmacy can influence adherence to ACCP guidelines for the management of elevated INR.

Self Assessment Questions:

What patient factors should be considered when determining the course of action for the treatment of elevated INR?

What practice patterns are most commonly associated with non-adherence to ACCP guidelines for the management of elevated INR?

RETROSPECTIVE STUDY OF PARENTERAL DRUGS AND FLUIDS FOR SUBCUTANEOUS INFUSIONS IN A PALLIATIVE CARE SETTING

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Purpose: To determine the feasibility of using continuous subcutaneous infusions (CSI) to administer selected drugs and fluids on a palliative care unit.

Methods: A retrospective medical chart review was conducted on consecutive admissions to a palliative care unit during 2003. Patients who were administered parenteral fluids and drugs for dehydration, pain, nausea and vomiting, seizures, agitation/delirium and bronchial secretions met the inclusion criteria. Patients admitted with peripherally inserted central catheters (PICC), mediports and those requiring intravenous (IV) access for chemotherapy, antibiotics or blood transfusions were excluded. Future goals include protocol preparation for CSI of selected fluids and drugs on the palliative care unit and education of palliative care nursing staff.

Results: The chart review identified 201 admissions to the palliative care unit during 2003. Fifty patients met the inclusion criteria. Symptom control could have been managed with CSI as follows: fluids (n=28), opioids (n=26), anitemetics (n=1), anticonvulsants (n=3), agitation/delirium (n=14) and bronchial secretions (n=11). Patients were excluded due to PICC (n=27) and mediport (n=8) placement at the time of admission, parenteral administration of chemotherapy (n=18), blood transfusions (n=1) and antibiotics (n=66). A total of 61 patients admitted to the unit required no IV therapy at all. Four PICC line placements could have been avoided after admission had CSI been instituted.

Conclusions: The oral route is preferred for drug administration, but may become intolerable as patients near the end of life. Frequently, drug delivery via rectal, transdermal or parenteral routes must be employed. Peripheral IV infusions are invasive, require high maintenance and access may be lost altogether. Central line placement often conflict with goals of providing comfort to this patient population. Drug administration via CSI can control many distressing symptoms as death nears and should be routinely utilized on a palliative care unit where applicable.

Learning Objectives:

To understand the role of CSI as viable alternatives to peripheral and central IV infusions to provide hydration and to control pain, nausea and vomiting, seizures, agitation/delirium and bronchial secretions in palliative care patients.

To understand the advantages of CSI over peripheral and central IV infusions.

Self Assessment Questions:

Maintenance of peripheral IV access is a major objective to provide symptom control in terminally ill patients. T or F

CSI requires the technical expertise of medically trained personnel to initiate and maintain these lines. T or F

A COMPARISON OF CARDIOVASCULAR OUTCOMES IN PATIENTS WITH DIABETES: ACE INHIBITORS VS. ANGIOTENSIN II RECEPTOR BLOCKERS

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Purpose:
Clinical trials suggest that inhibiting angiotensin converting enzyme (ACE) and antagonizing angiotensin II receptors delay and/or prevent morbidity and mortality in patients with diabetes mellitus at high risk for cardiovascular events. The primary objective is to determine if ACE inhibitors and angiotensin II receptor blockers (ARBs) offer the same cardiovascular protection in patients with diabetes mellitus. The secondary objective is a subgroup analysis between type 1 and type 2 patients with diabetes.

Methods:
Data from approximately 600 patients with diabetes mellitus at the Indiana University-Methodist Hospital Family Practice Center was collected for this retrospective, observational chart review from January 2001 – November 2004. Inclusion criteria included: diagnosis of type 1 or type 2 diabetes mellitus, age > 50 years, ACE inhibitor or ARB therapy, history of coronary artery disease, stroke, heart failure, or peripheral vascular disease plus at least one of the following: hypertension, elevated cholesterol, low high-density lipoprotein levels, or tobacco use. Exclusion criteria included: patients taking both an ACE inhibitor and an ARB, patients switched from an ACE inhibitor to an ARB, and patients switched from an ARB to an ACE inhibitor. The primary outcome is a composite of myocardial infarction, stroke, or death from cardiovascular causes. Secondary outcomes will be assessed. The percentage of patients in each group reaching primary and secondary outcomes will be calculated.

Results:
Results are pending further data analysis.

Learning Objectives:

Describe the evidence supporting the use of ACE inhibitors and ARBs in the prevention of cardiovascular outcomes in patients with diabetes mellitus.

Describe the difference in the mechanisms of action between ACE inhibitors and ARBs.

Self Assessment Questions:

T or F: Inhibition of the renin-angiotensin system is important in preventing cardiovascular outcomes in high-risk patients.

T or F: Unlike ACE inhibitors, ARBs offer the advantage of complete blockade of the renin-angiotensin-aldosterone system.

EVALUATION OF THE USE OF DOPAMINE AGONISTS IN OUR VETERAN HOSPITAL ON THE BASIS OF THEIR TOLERABILITY WITH REPSECT TO PATIENT AGE IN THE MANAGEMENT OF IDOPATHIC PARKINSON'S DISEASE

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Background: Levodopa has been the mainstay of therapy for patients with Parkinson's disease; however development of motor fluctuations may occur with therapy. Dopamine agonists therapeutic role in Parkinson's disease includes monotherapy or adjunct therapy to levodopa, particularly in younger patients. The rationale for avoiding the use of dopamine agonists in elderly patients includes an increased risk of drug interactions, altered drug metabolism, and increased risk of adverse events. The rate-limiting factor of dopamine agonist therapy is their adverse effect profile. Therefore, controversy exists regarding the use of dopamine agonists in elderly patients with Parkinson's disease due to concern of intolerable side effects.

Purpose: The primary aim of the study is to evaluate the use of dopamine agonists bromocriptine, pergolide, pramipexole, and ropinirole in our VA population on the basis of their tolerability with respect to patient age (≤ sixty-five and > sixty-five) in the management of idiopathic Parkinson's disease.

Methods: Computer generated list of patients, aged 18-99, who have been diagnosed with idiopathic Parkinson's disease, that have ever received a prescription since 2000 for one of the aforementioned dopamine agonists, and with at least one VAMC note for a visit prior to or on the day of and after initiation of dopamine agonist therapy will be included. A chart review evaluation will be performed on patients to assess total number and type of adverse reaction(s). Demographics will be collected to determine if a difference between the two groups exists. The percentage of patients tolerant and intolerant with respect to age will be calculated. All adverse reaction(s) will be compared to number of adverse reaction(s) in: ≤ sixty-five versus > sixty-five and subgroup analysis of the adverse reaction(s) will be displayed.

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

Learning Objectives:

Discuss the rationale for avoiding the use of dopamine agonists in elderly patients.

List the common adverse effects associated with dopamine agonists.

Self Assessment Questions:

Approximately half of all patients with Parkinson's disease typically develop motor fluctuations after 4-6 years of therapy. True/False

Adjunctive medications that reduce the frequency or duration of “off” periods include:
A. Dopamine agonists
B. Amantadine
C. MAO-B inhibitors
D. COMT inhibitors
E. A, C, & D
F. All of the above

EVALUATION OF HOW MULTIPLE MEDICATIONS AND ATYPICAL ANTIPSYCHOTICS CONTRIBUTE TO PATIENT FALLS ON A HOSPITAL GENERAL PSYCHIATRIC AND GEROPSYCHIATRIC UNIT

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Background: It is estimated that 33% of community dwelling elderly and 60% of nursing home residents fall each year. A current review of literature shows that falls are the primary etiology of accidental deaths in persons greater than 65 years of age and account for 70% of accidental deaths in those 75 years and greater. Of those elderly that fall, 20-30% sustain significant injury leading to decreased mobility and increased morbidity. There are many risk factors for falls including demographic factors, environmental hazards, physical deficits, and medications. Polypharmacy, defined as the use of four or more medications, is associated with an increased risk of falling. Likewise, atypical antipsychotics are drugs commonly used in the elderly that can cause significant side effects that can also contribute to falls. Each patient who has experienced a fall should have a thorough, multi-discipline evaluation, including an assessment of medications, to determine and treat the cause of the fall. University Hospital currently maintains a fall protocol to ensure patient safety and to facilitate fall documentation and reporting.

Purpose: To determine impact of polypharmacy and atypical antipsychotics on falls in an elderly psychiatric population.

Methods: A retrospective drug utilization review of elderly patients admitted to the general psychiatric unit between December 21, 2002 to December 20, 2003 and the geropsychiatric unit from July 1 to October 4, 2004 was completed. Data were then analyzed to determine demographics, current patient fall risks, and medication impact on falls.

Results: Ninety-four total patients were evaluated. Zero falls were documented on the general psychiatric unit and 3 falls were documented on the geropsychiatric unit.

Conclusions: No link can be determined between medication use and falls due to lack of documentation and reporting on both units. Further education of nursing staff on the falls protocol is essential.

Learning Objectives:

Discuss factors that can lead to falls in the elderly

Describe the impact pharmacy can have on fall prevention in the elderly

Self Assessment Questions:

True or False: Medications are not a likely contributor to falls and thus no pharmacy assessment is ever needed.

Patient fall risks may include:
a) incontinence
b) depression
c) confusion
d) use of a cane
e) all of the above

INCIDENCE AND TREATMENT OF MRSA PNEUMONIA IN A UNIVERSITY HOSPITAL

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The purpose of this study is to assess the efficacy of treatment prescribed for patients admitted to our institution with MRSA pneumonia, the incidence of MRSA pneumonia (not colonization) at our institution, the appropriateness of empiric therapy for suspected MRSA, and the appropriateness of definitive therapy for MRSA pneumonia.

A retrospective chart review will be performed for patients with positive MRSA sputum cultures admitted from January 1, 2004 to September 30, 2004. Each patient will be evaluated for MRSA pneumonia based on accepted clinical criteria. Patients will be excluded if they are pregnant, < 18 years of age, are not being fully medically supported, antibiotic therapy is withdrawn, or if it is determined positive sputum culture is colonization only. Patients will be excluded from outcomes analysis only.

Patients determined to have MRSA pneumonia will be assessed for MRSA risk factors. If any of the risk factors are present, the patient will be assessed for the initiation of empiric therapy providing MRSA coverage. Patients without MRSA risk factors will be assessed for appropriate empiric antibiotic therapy per IDSA guidelines.

Therapy modification based on organism susceptibilities will be defined as appropriate definitive therapy if the drug prescribed is active in vitro against the isolated strain of MRSA.

Patients who are determined to have MRSA pneumonia and receive therapy will be assessed for efficacy of treatment (EOT). Patients will be divided into one of the following four groups: cure, failure, indeterminate, and missing. For the purpose of statistical analysis, patients in the cure and indeterminate groups will be compared to those in the failure and missing groups.

The primary outcome that will be studied and compared between the two patient populations will be efficacy of treatment. Secondary outcomes include true incidence of MRSA pneumonia, appropriateness of empiric and definitive therapy.

Learning Objectives:

Identify risk factors for MRSA pneumonia to improve initiation of appropriate antibiotic therapy.

Discuss and compare potential antibiotic therapies for MRSA pneumonia.

Self Assessment Questions:

List the risk factors for MRSA pneumonia.

What are the antibiotic options for MRSA pneumonia?

AN EVALUATION OF DOSING OF SELECTED ANTI-EPILEPTIC DRUGS IN A PEDIATRIC HOSPITAL SETTING

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The purpose of this drug use evaluation is to assess dosing and the effect of an education program for medical residents about serum drug level (SDL) timing.

This analysis will be done in a retrospective, observational manner utilizing a customized computer report. All patients admitted to a pediatric tertiary care teaching institution from 1/1/03 to 11/1/04 with active orders for the following medications were included in this evaluation: felbamate, levetiracetam, lamotrigine, oxcarbamazepine, topiramate, and zonisamide. Patients who did not have documented weights in the pharmacy computer system were excluded from this analysis. For the purpose of evaluation, subjects will be broken into four subsets by age: infant (<23mo), preschool child (23mo – 5 years), Child (6-12 years), adolescent (12-18 years). This evaluation has shown that our serum drug level timing is less than optimal. In order to improve practice, we will provide educational sessions to the medical residents and will report the effect.

The indicators for this analysis are patient age and dosing (on mg/kg basis), mean and median dose, percent usage of each drug in this institution. Lamotrigine shows an increase in dose as age increases; 0.08mg/kg/day in infants to 21.3mg/kg/day in adolescents. Felbamate shows an increased dose in pre-school aged children; 63.2mg/kg/day in pre-school to 33.9mg/kg/day in school aged children and adolescents. Levetiracetam shows a slight increase in dose in pre-school and school aged children, 38.5 and 39.4mg/kg/day as compared to infants and adolescents, 27.1mg/kg/day and 29.2 mg/kg/day respectively. The SDL timing results are pending at this time.

This evaluation has shown that there are age-related dosing differences for these medications at our institution. It is important to take into account age-specific pharmacokinetic parameters when choosing an appropriate dose for a child on these medications. The effect of education on SDL timing for selected anti-epileptic drugs will be reported.

Learning Objectives:

Recommend an appropriate dose of the selected medications for a pediatric patient.

Utilize the information about SDL timing to improve patient care

Self Assessment Questions:

Which age groups consistently need higher weight based doses?
a. Pre-school and school age children
b. Infants and adolescents
c. Infants and pre-school children
d. School age children and adolescents

The timeframe for peak level timing following an IV dose is later than an oral dose. T or F

DEVELOPMENT OF A CLINICAL PHARMACIST COMPETENCY MODEL

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Background: The role of a clinical pharmacist continues to evolve, as the profession of pharmacy becomes progressively more specialized. Once dependent on production and distribution, the profession now increasingly focuses on patient care and drug therapy management. This change escalates clinical responsibilities, and places mounting pressure on clinicians, supervisors, and institutions to ensure competency when providing clinical services not identified in original licensure or annual continuing education credits.

Objective: The objective of this project is to create a useful and sustainable clinical competency model for pharmacists' daily clinical skills to ensure safe and effective clinical practice that can be an addition to the institutional practice of pharmacists at this institution and beyond. The model developed will detail competency frequency, the skills to be addressed, and designated activities to facilitate the completion of these skills.

Methods: Current literature, other local institutions' experiences, management expectations, and clinician input will be considered to create a lasting model. Five randomly chosen clinical staff have evaluated a pilot survey, created to assess the value of the tool in gathering clinicians' thoughts on competency testing. Next, all licensed pharmacy staff answered a modified and improved version of the survey to collect ideas and expectations surrounding competency measurement. Staff pharmacists' input and clinical managers' vision will ultimately be combined. At the project's completion, the proposed model will be presented to clinical staff, and adequate feedback will be solicited.

Preliminary Results: Based upon staff and administrative desires, clinical competence will be demonstrated through the creation of both a core/basic competency skill model and a clinical development competency model. Core skills will be completed individually through readings, and computerized questions. Clinical development will occur during weekly teaching in a group setting. The punctual completion of both will be linked to pharmacists' evaluations performed annually by clinical managers.

Learning Objectives:

Understand why demonstration of clinical competency is important for pharmacists in an institutional setting.

Identify key issues surrounding skill assessment that should be considered when developing an institutional pharmacist competency model.

Self Assessment Questions:

Why is the demonstration of clinical competence especially important for pharmacists in institutional practice today?

List three important issues to consider when developing a clinical competency model for institutional pharmacists.

DEVELOPMENT OF A DEEP VENOUS THROMBOSIS PATHWAY IN A COMMUNITY TEACHING HOSPITAL

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Treating patients with deep venous thrombosis (DVT) as an outpatient is becoming a standard of practice. This therapy is more convenient for the patient and less costly for hospitals. The primary objectives of this study are to increase the number of DVT patients that are discharged directly from the emergency room and to ensure that the patients receive the proper education regarding their treatment.

A multi-disciplinary committee will work together to develop a pathway. The committee will consist of members from pharmacy, nursing, medicine, social work, physical therapy and finance. The pathway will be presented to the Pharmacy and Therapeutics Committee and, upon approval, the pathway will be implemented at that time. Implementation will include educating medical staff on the use of the pathway. Data on length of stay, financial savings to the hospital, adverse events, re-admissions, medical staff satisfaction, and patient satisfaction will be collected during the first two to four months following implementation. This data will be analyzed and necessary modifications to the pathway will be made.

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

Learning Objectives:

Describe the role of a pharmacist in the development and implementation of a clinical pathway.

Recognize patients who are eligible for outpatient treatment of deep venous thrombosis

Self Assessment Questions:

A patient who had total knee replacement surgery one week ago is eligible for outpatient deep venous thrombosis treatment. T/F

What are the advantages and disadvantages of outpatient DVT treatment?

RISK FACTORS FOR UPPER GASTROINTESTINAL BLEEDING IN AN OUTPATIENT VETERAN POPULATION TAKING WARFARIN

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The Veterans Affairs Ann Arbor Health System (VAAAHS) Anticoagulation Clinic follows a population of veterans at high-risk for gastrointestinal (GI) bleeding due to several factors: warfarin therapy, age greater than 65 years, use of concomitant medications such as corticosteroids, NSAIDs, and antiplatelet agents, cigarette smoking and alcohol use. In 2001, the anticoagulation clinic providers initiated the practice of prescribing Proton Pump Inhibitors (PPIs) for upper GI prophylaxis in certain high-risk warfarin-treated patients. To date, no studies have been identified that examine the risk of upper GI bleeding or the benefit of PPIs in high-risk warfarin-treated patients. This study examines the presence of risk factors for and occurrence of upper GI bleeding in the VAAAHS Anticoagulation Clinic population.

This single-center, cross-sectional, retrospective study consists of two, six month study periods: March 1 to August 31, 2001, prior to the routine use of PPIs, and March 1 to August 31, 2004, after the routine use of PPIs in high-risk patients. The following data will be collected from the chart review: sex, age at start of the study period, INR goal, indication for warfarin therapy, duration of warfarin therapy at start of the study period, INR values during study period, history of or current peptic ulcer disease and/or upper GI bleeding events, alcohol consumption, smoking status, and concomitant use of oral corticosteroids, NSAIDs including cyclooxygenase-2 (COX-2) inhibitors and aspirin, antiplatelet agents (clopidogrel, ticlopidine, dipyridamole), low molecular weight heparins, misoprostol, H2-receptor antagonists (H2RAs), and PPIs. From this data, the presence of risk factors for upper GI bleeding will be determined and the occurrence of upper GI bleeding events will be compared before and after the practice of initiating PPI therapy.

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

Learning Objectives:

To determine the presence of risk factors for the development of upper GI bleeding in VAAAHS Anticoagulation Clinic patients

To compare the occurrence of upper GI bleeding events in the VAAAHS Anticoagulation Clinic population before and after the practice of initiating PPIs therapy in high-risk patients

Self Assessment Questions:

The use of PPIs for upper GI prophylaxis in high-risk patients taking warfarin has been extensively studied. T/F

Risk factors for upper GI bleeding events include: use of certain medications including warfarin, NSAIDs, and corticosteroids, alcohol use, and cigarette smoking. T/F

EVALUATION OF RISK FACTORS FOR WOUND HEALING COMPLICATIONS IN PATIENTS TREATED WITH SIROLIMUS POST-KIDNEY TRANSPLANTATION

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Background: Impaired surgical site wound healing is a well documented complication in 35 – 50% of patients receiving sirolimus. Sirolimus impairs fibroblast function and impedes angiogenesis in vitro. Wound healing may be further hindered by other cofactors including concomitant immunosuppressive medications (e.g, corticosteroids), high body mass index and smoking, but whether these and other conditions interact with sirolimus to promote surgical site complications (SSC) has not been well studied.
Purpose: To determine possible cofactors for SSC among renal allograft recipients receiving sirolimus.
Methods: Approval for this study has been obtained from the UIMCC Institutional Review Board. Retrospective chart reviews will be conducted for renal allograft recipients treated with sirolimus within 6 weeks of transplant between 1/1/00 and 9/1/04. Patients will be identified through immunosuppressant use data collected by the UIMCC Hospital Pharmacy Services and outpatient clinic records. Once identified, study patients will be matched for age, gender, and race 2:1 with controls who have received sirolimus but have not developed SSC. For all patients meeting study criteria, the following data will be collected for up to 3 months post-transplant: demographics, donor source and date of transplant, pre-operative and post-operative immunosuppressive and prophylactic medications, post-transplant surgical procedures, episodes of rejection, body mass index, smoking history, co-morbidities, and radiographic results. The primary endpoint of the study, SSC, is defined as wound dehiscence, wound hematoma, abscess, cellulitis, urine leak, lymphocoele and incisional hernia, and data on this endpoint will be collected as well. Risk factors for the development of wound healing complications will be assessed by comparing study patients and controls. Mean values for risk factors will be analyzed by using Fisher's Exact test or 2 test depending on the number of patients falling in the different risk factor categories.
Results: Data are forthcoming and will be presented at GLRC.

Learning Objectives:

Characterize the frequency and nature of surgical site complications associated with sirolimus use in renal transplant patients.

Identify subgroups of patients who may have wound healing complications while receiving sirolimus.

Self Assessment Questions:

Name two risk factors mentioned in the current literature that may contribute to wound healing complications due to sirolimus.

What percentage of patients is likely to develop wound healing complications due to sirolimus?

EVALUATION OF AN INTENSIVE INSULIN INFUSION PROTOCOL AMONG CRITICALLY ILL PATIENTS IN THE ICU OF A COMMUNITY HOSPITAL

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Hyperglycemia is common among critically ill patients, with or without a previous history of diabetes. Achieving normoglycemia has been shown to decrease morbidity and mortality. In response to these findings in the literature, a nursing-managed intensive insulin infusion protocol was developed in December 2002 to achieve blood glucose (BG) levels in a target range of 91 to 130 mg/dL. The primary outcome of this IRB-approved study is to evaluate the efficacy of the insulin infusion protocol in maintaining BG control. The secondary outcomes are to determine the impact of the protocol on morbidity and mortality in the ICU and identify areas for protocol improvement.

This retrospective, observational chart review included all patients 18 years of age and older admitted to the medical ICU and receiving an insulin infusion. Patients admitted with a diagnosis of diabetic ketoacidosis were excluded. Baseline data was collected one year prior to initiation of the protocol, December 2001 to November 2002, and during a six-month period of using the nursing-managed protocol, February 2004 to August 2004. Data collection included patient demographics, incidence of hypoglycemia, time to achieve BG goal, and time within the target BG range. Other data collected includes length of ICU stay, duration of mechanical ventilation, vasopressor/inotrope requirements, need for dialysis, extended course of antibiotics, occurrence of septicemia or superinfection, and overall mortality.

A total of 269 patients were evaluated in the study. Preliminary results show a reduction in mortality rate from 30% to 20% after implementation of the insulin infusion protocol among ICU patients. Final results will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Identify the benefits of an intensive insulin infusion protocol on blood glucose management.

List limitations of using an insulin infusion protocol and describe how these may change the management of hyperglycemia in critically ill patients.

Self Assessment Questions:

Maintaining normoglycemia (80 to 110 mg/dL) in ICU patients can decrease overall mortality. (T/F)

Severity of illness, nursing time, and risk of hypoglycemia are limitations to using an insulin infusion protocol. (T/F)

BROAD-SPECTRUM ANTIBIOTIC SELECTIVE PRESSURE: MICROBIAL TRENDS IN AN ACADEMIC MEDICAL CENTER

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Background/Objective: Attentiveness to antimicrobial sensitivities has become increasingly important due to the inevitability of antibiotic resistance and the call for antibiotic stewardship. The overuse of broad-spectrum antibiotics leads to the emergence of resistant organisms. This necessitates that institutions become more vigilant in the monitoring of antibiotic prescribing patterns and the identification of potentially related resistance trends.

Froedtert Hospital is a 426-bed academic medical center in Milwaukee, Wisconsin. This level one trauma center contains 52 intensive care unit beds and a bone marrow transplant unit. This hospital-wide retrospective analysis searched for relationships between antibiotics administered and susceptibilities of specific bacteria over a five year span.

Methods: The broad-spectrum antibiotics included in this review were: ciprofloxacin, moxifloxacin, cefepime, piperacillin/tazobactam, ampicillin/sulbactam, ertapenem, and imipenem/cilastatin. Purchasing data were used to determine monthly usage of each antibiotic measured in grams per patient day. The bacteria evaluated were Klebsiella pneumoniae, Escherichia coli, Clostridium difficile, Serratia spp., Acinetobacter baumannii, Pseudomonas aeruginosa, Enterobacter spp., and Enterococcus spp. Microbiology lab data were used for sensitivity information. Data from January, 1999 through December, 2004 were examined. Timeline analysis and graphing sensitivity data were used to identify any relationships between antibiotic usage and changes in sensitivities. The immediate goal was to provide objective data to support and reinforce the importance of current antibiotic guidelines at this institution and to recognize where modifications and reinforcements are necessary.

Results: Analysis is ongoing. Results will be presented at Great Lakes Conference.

Learning Objectives:

To summarize current microbial trends in a tertiary care facility in comparison to national trends

To evaluate correlation between prescribing patterns and antimicrobial sensitivities

Self Assessment Questions:

_____T/F Antimicrobial trend analysis can be a useful tool to help influence current prescribing practices

_____T/F Proper antibiotic prescribing can have a positive impact on reducing resistance

DEVELOPMENT OF A PHARMACIST-MANAGED DIABETES SELF-MANAGEMENT EDUCATION PROGRAM.

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Background:
Adherence to diabetic treatment guidelines and the provision of quality healthcare requires continuous long-term education and monitoring of patients. An environment in which a pharmacist is routinely working with patients and their physician will provide this type of care. Muskegon Family Care is a non-profit, federally-qualified family practice group located in Muskegon, Michigan. This clinic serves patients who often do not speak English as a primary language, are uninsured, and have low literacy levels.

Purpose:
The purpose was to develop a clinical and financially sustainable program that would provide the pharmacist with tools to evaluate patient compliance, functional literacy level and their willingness to learn. This would enable the pharmacist to implement individualized teaching techniques in response to the patient's medical and social needs.

Method:
Primary literature and consensus guidelines based on the American Association of Diabetes Educators and Joint Commission on Accreditation of Healthcare Organization were reviewed to ensure clinical quality and consistency. Patient educational materials, adult literacy assessment tools, and compliance surveys were evaluated for appropriateness. Different reimbursements structures by Medicare, Medicaid, and Commercial providers were explored. A business plan was created that analyzed the financial costs and benefits of the proposed program. A pharmacist-managed education model was designed that would provide education on self-management topics and address barriers to care. The evaluation tools and business plan will be presented to Muskegon Family Care and scheduled to start July 2005.

The model structure and business plan will be presented at the Great Lakes Residency conference in April.

Learning Objectives:

Identify obstacles that may be encountered while implementing a pharmacist managed clinical program

Describe the tools and processes needed to start an educational program.

Self Assessment Questions:

T/F Lack of consistency in obtaining reimbursement is a barrier that will have to be overcome for pharmacist to engage in sustainable clinical activities.

T/F Formally assessing a patient's literacy level and willingness to learn is important in teaching a clinical educational program.

IMPLEMENTATION OF A DEEP VENOUS THROMBOSIS PROPHYLAXIS PROGRAM

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Literature identifies that venous thromboembolic events will affect an estimated 2 million patients yearly. Pulmonary embolism (PE) results in approximately 50,000 deaths in the United States annually. Deep venous thrombosis (DVT) has been shown to lead to increased long term morbidity.

The purpose of this project is to minimize morbidity and mortality related to thromboembolism by establishing methods to rapidly identify patients at risk for DVT or PE and developing DVT prophylactic guidelines.

Methodology: A multidisciplinary task force was created to review and approve a plan of action using an evidence-based approach for formulation of prophylaxis guidelines. These guidelines were presented to the Pharmacy and Therapeutics and Medical Executive Committees of the institution for approval. Triggers to identify patients at risk for developing a DVT or PE were identified by the task force. This trigger system allows for rapid identification of patients at risk for DVT or PE formation and drives initiation of the newly established guidelines. Education was provided to medical, nursing and pharmacy staff prior to implementation. Education included presentations at department meetings, placement of guidelines on the hospital intranet, collaboration with nurse educators and newsletters to physicians. Baseline data was collected on newly admitted patients to establish current practice. This review included patient risk factors for DVT formation, contraindications for anticoagulation prophylaxis and percent of patients receiving adequate prophylaxis. A follow up audit will be conducted to evaluate the effectiveness of the initiative.

Results: Baseline data showed that only 30% of patients received DVT prophylaxis. A Thrombosis Risk Assessment and Physician Standing Order form was therefore created and implemented based on current literature and physician recommendations. The components of this form included patient risk factors, contraindications to therapy and prophylaxis options. Data collection is in process and will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Define patient risk factors for DVT formation.

Identify patients at risk for DVT formation using a Thrombosis Risk Assessment and describe the appropriate intervention for prevention of DVT formation.

Self Assessment Questions:

Patient risk factors for DVT formation include :
a. Congestive Heart Failure
b. Major surgery
c. Hypertension
d. Elevated cholesterol
e. Oral contraceptives or hormone replacement therapy
I. a,d,e
II. a,b,e
III. b,c,d,e
IV. b,d,e

A 61 year old male with is admitted to hospital with a diagnosis of pneumonia. His past medical history is significant for congestive heart failure and hypothyroidism. How many risk factors does the patient have for developing a DVT and what is the appropriate prophylactic regimen?
a. 5 and Intermittent Pneumatic Compression
b. 3 and enoxaparin 30mg subcutaneously twice a day
c. 4 and heparin 5,000 units subcutaneously three times a day
d. 5 and heparin 5,000 units subcutaneously three times a day

EVALUATING CLINICALLY APPROPRIATE ERYTHROPOIETIN USE IN HEART FAILURE PATIENTS

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Anemia has been identified as a potentially significant comorbid condition in the heart failure (HF) population. Despite the current inability to explain the exact pathophysiology of anemia in this population, treatment with erythropoietic agents may offer a novel therapeutic addition to current HF medication regimens. Although erythropoietic agents should be effective, controversy exists regarding their correlation with improved HF-associated morbidity and mortality. Based on the literature, the HF population that may benefit from exogenous erythropoietin therapy includes patients with: 1) hemoglobin <12 g/dL, 2) repeated episodes of acute decompensated HF, and 3) receiving maximally tolerated oral therapy for HF at erythropoietin initiation or consideration.

The primary objective of this study is to determine if The Ohio State University Medical Center's (OSUMC's) erythropoietin utilization is an appropriate addition to current standard of care for HF. The secondary objective is to evaluate the prevalence and severity of anemia in the HF population at OSUMC.

This retrospective chart review will evaluate all patients admitted to the HF service at OSUMC between July 1, 2003 and June 30, 2004 using OSUMC billing records. Patients with diastolic dysfunction (left ventricular ejection fraction (LVEF) > 40%) or end-stage renal disease (ESRD) will be excluded. Demographic data collected will include: patient age, sex, LVEF, New York Heart Association (NYHA) functional class, and HF medication regimen at admission. The following baseline laboratory parameters will also be collected: hemoglobin/hematocrit, serum creatinine, and serum albumin. In addition to demographic and baseline data, the following parameters relating to the course of erythropoietic therapy will be evaluated: hemoglobin/hematocrit on initiation and discharge, drug dosage/frequency, iron supplementation, and discharge erythropoietic regimen. The outcomes evaluated include hospital length of stay, hospital readmission, and overall mortality during the study period.

Final results and conclusions will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

To understand the etiology and pathophysiology of anemia in heart failure

To understand the pharmacologic effects of erythropoietin in the heart failure population

Self Assessment Questions:

T or F Severity of anemia appears to be directly proportional to NYHA functional class.

T or F In addition to its ability to stimulate red blood cell production, erythropoietin also plays a role in myocardial remodeling.

PROPHYLAXIS AND TREATMENT OF POST-OPERATIVE NAUSEA AND VOMITING IN PEDIATRIC PATIENTS: EVALUATION OF SAFETY AND OUTCOMES.

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Purpose: Nausea and vomiting are common complications post-operatively and pediatric patients have an increased risk when compared to adults. Providing prophylaxis to the high-risk patients identified by current guidelines can improve patient and parent satisfaction, decrease length of stay, and reduce expense associated with its treatment. The purpose of our research is to develop a better understanding of the prescribing patterns of antiemetic agents in our institution and evaluate their safety and efficacy.

Methods: This is a prospective chart review at Toledo Children’s Hospital. Patient’s charts will be reviewed for the use of antiemetic agents, efficacy of prophylaxis, and adverse events. Data will be collected on surgical patients admitted to Toledo Children’s Hospital during a three to four month period in 2004-05. Patients were identified by a computer report, generated daily, for all active antiemetic orders. Efficacy of prophylaxis will be evaluated by incidence of PONV. Safety will be assessed by examining patients’ laboratory values and reports of adverse effects that occur during therapy. In order to detect a difference between patients who received prophylaxis and those who did not, a sample size of 62 in each group is needed.

Preliminary Results: Data collection is ongoing. Data has been collected for a total of 65 patients who received prophylaxis and 36 who did not. At this point the incidence of PONV in patients who received prophylaxis was 24.6%, compared to 44.4% incidence in non-prophylaxis group. To date there have been no adverse events associated with antiemetic agent use in study patients.

Learning Objectives:

Discuss the risk factors, treatment, and prevention of PONV.

Identify proper monitoring, dosing, and potential adverse effects of antiemetic agents.

Self Assessment Questions:

1. All of the following are risk factors for PONV, except:
a. Gender of patient
b. Length of procedure
c. Type of procedure
d. Weight of patient

2. True or False The use of prophylaxis in surgical patients can greatly reduce the overall incidence of PONV.

EFFICACY OF LOW COMPARED TO STANDARD DOSE RASBURICASE IN ADULTS

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Statement of Purpose: Patients with hematological malignancies or solid tumors are at risk of developing tumor lysis syndrome (TLS); with hyperuricemia being one of TLS's complications. Rasburicase is a recombinant form of urate oxidase, an enzyme not endogenous in humans. Rasburicase converts uric acid to allantoin, which is more readily excreted by the kidneys. The FDA approved rasburicase in July 2002 for malignancy-associated hyperuricemia in pediatrics. This indication has not yet been extended to include adults. Therefore dosing in this population has not been established. Current literature has shown success with doses ranging from 0.017 mg/kg as a single dose to 0.2 mg/kg daily for 5-7 days. Our objective was evaluation of patient response following low (< 9 mg) compared to a standard pediatric dose (0.15-0.2 mg/kg) of rasburicase in adults.
Methods: This study has been approved by the Institutional Review Board. Patients in this single center retrospective review are cancer patients who received rasburicase between March 2004 and March 2005. Data was collected for 24 hours pre- to 96 hours post- rasburicase dosing. Data included diagnosis, pertinent laboratory values, medication administered, and fluid usage. All data will be recorded without patient identifiers and maintained confidentially. Changes in uric acid following administration of rasburicase will be reviewed.
Results: Low dose rasburicase was administered in 6 of 22 doses (27%). Within 10 hours 5 of these 6 doses uric acid levels returned to normal levels (serum uric acid 4.4-7.6 mg/dL). Further data collection and analysis will be presented at Great Lakes Conference.
Conclusions: To be forthcoming.

Learning Objectives:

Determine efficacy of low dose compared to standard dose rasburicase in an adult population.

Evaluate criteria for use of rasburicase in the adult population.

Self Assessment Questions:

True or False: Low dose rasburicase is effective in reduction of uric acid due to tumor lysis syndrome.

Discuss how rasburicase should be used in the adult population.

EFFECTIVE UTILIZATION OF WARFARIN IN PEDIATRIC CARDIOVASCULAR SURGERY PATIENTS. A RETROSPECTIVE REVIEW OF DOSING AND TIME SPENT ATTAINING A THERAPEUTIC INR VALUE.

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Warfarin therapy is used in children for the prevention and treatment of thromboembolic and hypercoaguable disorders. In children with congenital heart disease (CHD), warfarin is most often used to prevent thrombotic complications associated with the Fontan completion and with mechanical or biological prosthetic heart valves.
There is limited evidence available that standardizes warfarin dosing in the pediatric population. One warfarin dosing nomogram has been prospectively evaluated in children; however, this nomogram is not the standard protocol for warfarin dosing at our institution. The primary goal of this study is to determine the percentage of pediatric cardiac surgery patients that reach a desired INR within five days after initiation of warfarin therapy using current dosing methods.

This is a retrospective chart review of patients receiving warfarin from August 1, 2003 to August 31, 2004. Post-operative cardiac surgery patients initiated on warfarin during the specified hospital stay were included. Exclusion criteria were patients over 18 years of age, patients not receiving cardiac surgery, and patients who were started or maintained on warfarin as an outpatient prior to surgery. Patients discharged from the cardiology or cardiovascular surgery services were screened by use of discharge summaries. Seventy-three discharge summaries were assessed, and forty-seven patients were excluded because of age, previous warfarin therapy, or warfarin therapy for indications other than post-operative prevention. The following data were collected: patient demographics (age, gender, weight), details of surgical repair, indication for warfarin therapy, desired INR range, days after surgery until warfarin initiation, warfarin dosing, laboratory values (INR, hemoglobin, hematocrit, platelet count), and concurrent medications. Average dose requirements to achieve a desired INR and average days until a therapeutic INR was attained were calculated. Adverse events directly related to warfarin therapy were recorded and evaluated.

Learning Objectives:

Recognize the barriers associated with implementing a consistent warfarin dosing guideline in the pediatric population.

Understand the risks associated with inappropriate warfarin dosing.

Self Assessment Questions:

Which of the following has not been proposed as an appropriate INR range in pediatric patients?
a. 1.4 – 1.8
b. 2.5 – 3.5
c. 0.9 – 1.2
d. 1.3 – 1.7

Defend or challenge the theory of warfarin loading in patients beginning warfarin therapy.

PHARMACY RESIDENT INVOLVEMENT AT A FREE CLINIC

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Purpose:
The Columbus Free Clinic (CFC) operates one night a week to serve the Columbus indigent population. CFC is managed by medical students who coordinate the volunteers and perform initial patient interviews and medical histories. Physician volunteers evaluate patients, write prescriptions, and order laboratory tests. Involvement of the pharmacy residents at CFC was pursued to: provide pharmacy residents with an opportunity for community service involvement, increase awareness of the value of pharmacists among medical students and physicians, and present residents with an opportunity for interdisciplinary practice in an ambulatory setting.

Methods:
Initial resident involvement at CFC was sought by a physician who valued pharmacy services in her own practice and identified a need for their expertise in this setting. Upon request of the clinic director, a pharmacy resident and residency coordinator met with CFC leaders to propose a role for the pharmacy residents. Guidelines outlining these roles were prepared so pharmacy residents would have a clear idea of performance expectations. One pharmacy resident was established as a liaison.

Results:
Initially, residents participated in the logging of sample medications and the removal of expired samples. The role of the pharmacy resident has expanded to providing drug information regarding unfamiliar medications and therapeutic interchanges. Medical students are educated regarding how to access patient education materials and provided with verbal suggestions for counseling patients. Future initiatives include development of a clinic formulary, pursuit of grant monies to purchase generic formulary medications, involving non-resident pharmacists in the clinic, and identifying a resident liaison to the clinic for next year.

Conclusions:
Collaboration with CFC has presented a positive experience for pharmacy residents to influence patient care and educate physicians and medical students regarding the benefits a pharmacist can bring to an ambulatory clinic setting.

Learning Objectives:

To understand how a medical center provided a community service component to its residency program.

To understand the benefits of pharmacy involvement with a free clinic.

Self Assessment Questions:

How could community service be incorporated into a residency program?

What benefits could be expected by having residents more involved in community service?

AN ANALYSIS OF INVASIVE ASPERGILLOSIS INCIDENCE AND OUTCOMES AMONG LUNG TRANSPLANT PATIENTS

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Background: Invasive aspergillosis (IA) is a potentially fatal infection, which may affect immunocompromised patients. A previous study examined the incidence and attack rates of IA among solid organ transplant patients at The Cleveland Clinic Foundation (CCF) from 1990 to 1999. During this time 2046 patients underwent solid organ transplants and the incidence rate was found to be 4.8 per 1000 patient years. Lung transplant patients developed IA more frequently than patients who underwent other types of transplants (12.8% vs. < 1%). Since that time, changes in immunosuppressive regimens were made and additional antifungal options for the treatment of invasive aspergillosis have become available. Therefore, the goal of this study is to examine incidence and mortality rates of IA cases among lung transplant patients at the CCF from 2000-2004.

Method: A retrospective and concurrent analysis will be performed to determine the incidence and mortality rates of IA among lung transplant patients. Medical records of patients diagnosed with IA from 2000 to 2004 will be reviewed to establish the absolute incidence, incidence per patient year, and incidence in the first year post transplant as compared with subsequent years. The following data will be collected on each patient: length of illness, method of diagnosis, immunosuppressant regimen, aspergillosis prophylaxis and treatment regimens, Aspergillus species, and site of infection. Results will be compared to the previous study.

Results/conclusions: Results and conclusions to be presented during the conference.

Learning Objectives:

Examine the incidence and mortality rates of invasive aspergillosis among lung transplant patients at The Cleveland Clinic Foundation from 2000-2004.

Determine whether there is a difference in prophylaxis or treatment between the transplant patients that did and did not develop invasive aspergillosis.

Self Assessment Questions:

T/F Lung transplant patients develop invasive aspergillosis at a higher rate than other solid organ transplant patients at The Cleveland Clinic Foundation.

T/F Despite advances in antifungal therapy invasive aspergillosis continues to have a high mortality rate.

TRENDS IN UTILIZATION OF BETA-ADRENERGIC BLOCKERS IN PATIENTS WITH CHRONIC HEART FAILURE

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Background:
Within the past decade, treatment with beta-adrenergic blockers has been shown to reduce mortality and decrease the symptoms of heart failure (HF). As a result, a substantial increase in use of these agents over the past several years would be expected. As clinicians consider several factors when selecting an appropriate beta-adrenergic blocker for the management of patients with HF, the VA PBM and its Medical Advisory Panel (PBM-MAP) developed a document outlining considerations to assist clinicians in selecting a beta-adrenergic blocker for treatment of patients with HF. Current trends in utilization suggest that the beta-adrenergic blockers are underprescribed in patients with HF or are not titrated to target doses demonstrated to provide benefit in clinical trials.

Objectives:
The goals of this study is to evaluate the prescribing patterns of beta-adrenergic blockers in patients with New York Heart Association (NYHA) class II-IV HF at one VA medical center, and to determine if the agents are being prescribed appropriately as described in the PBM-MAP Recommendations for Use. The secondary objective is to determine the percent of cardiovascular-related mortality in this patient population.

Methods:
This will be a descriptive retrospective database and medical chart review of Hines VA patients from the time period of April 1, 2002 – September 30, 2004. The following endpoint measures will be calculated: percent utilization of each beta-blocker and overall use; average daily dose; percent of patients titrated to target doses, not adherent to drug therapy, who discontinued therapy and reasons for discontinuation, on combination therapies, and with potential contraindications to beta-adrenergic blockers, ACEIs or ARBs; switching patterns; and cardiovascular-related mortality rate.

Results/Conclusion:
Data collection is in process. Data analysis, results, and conclusions will be presented.

Learning Objectives:

To evaluate the prescribing patterns of beta-adrenergic blockers in patients with class II-IV HF.

To determine if the beta-adrenergic blockers are being prescribed appropriately according to PBM-MAP Recommendations for Use.

Self Assessment Questions:

The beta-adrenergic blockers were prescribed appropriately as described in the PBM-MAP Recommendations for Use in patients with class II-IV HF at one VA medical center. T or F

Beta-adrenergic blockers have been shown to reduce mortality and decrease the symptoms of heart failure. T or F

IMPACT OF FAIR BALANCE PHARMACOLOGY UPDATES ON SOURCES FAMILY MEDICINE RESIDENT PHYSICIANS UTILIZE TO OBTAIN INFORMATION REGARDING MEDICATIONS

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Introduction:
Many residency programs control the amount of contact Pharmaceutical Sales Representatives (PSR) have with resident physicians to control against potentially biased information being disseminated. Some programs ban PSR while others institute policies that limit their contact with resident physicians. Saint Joseph Family Medicine Residency Program has a set policy that PSR may only present information to resident physicians in the supervised environment of noon conference. Whether PSR should be allowed to detail the Family Medicine Resident Physicians (FMRP) in any capacity has been a long-standing debate within Saint Josephs Family Medicine Residency Program. Among the arguments in favor of continuing the current policy, presented by the FMRP, was the perception that PSR are the majority source of their current medication information. So the question was posed, if this perception is real should we, as pharmacy, spend our time revising policy or educating the FMRP?

Purpose:
The purpose of this interventional study was to assess where Saint Joseph FMRP obtain their current medication information and how that is impacted by bimonthly 10-minute fair balance pharmacology sessions covering new agents and/or indications. A secondary purpose of this study was to assess the value FMRP place on information provided by PSR.

Methods:
A survey tool was created to assess where the FMRP obtain their current medication information and the value they place on their contact with PSR. The survey was given pre and post intervention with participation being voluntary and anonymous. The fair balance pharmacology sessions were conducted by the pharmacy practice resident or a second year FMRP. The agendas for these sessions were created from the contents of current issues of Medical Letter, Prescriber's Letter and STEPs from American Family Physician.

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

Learning Objectives:

Understand the influence Pharmaceutical Sales Representatives can have on the education of Family Medicine Residents.

Recognize quick, non-bias references that physicians may use to keep current in the field of pharmacology.

Self Assessment Questions:

T or F Pharmaceutical Sales Representatives have no influence on the prescribing habits of physicians.

Name two non-bias publications that physicians may reference for current pharmacology news.

EFFECT OF SWITCHING FROM COMBINATION LIPID LOWERING THERAPY TO ROSUVASTATIN

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Objective

The primary objective of this study is to measure the change in LDL (low-density lipoprotein) cholesterol when switching patients from combination lipid lowering therapy (statin plus a second lipid lowering agent) to rosuvastatin. The null hypothesis for this investigation is that the LDL measured before and after the switch to rosuvastatin will not be clinically or statistically different. The secondary objectives of this study will be to evaluate number of patients at LDL goal; the impact on HDL (high-density lipoprotein) and trigylcerides; and number of patients with adverse events, defined as increase in LFTs, increase in CK, or subjective symptoms of muscle pain.

Methodology

A retrospective chart review will be performed on patients who were not controlled on combination lipid lowering therapy and were switched to rosuvastatin between April 1, 2004 and Decemeber 31, 2004 at the Chalmers P. Wylie Veterans Affairs Outpatient Clinic. The patient population will be generated using a fileman report to locate all the patients that were taking rosuvastatin during this time.

Patients will be included if they were on a stable dose of combination lipid lowering therapy for a minimum of two months prior to the conversion to rosuvastatin and were maintained on a stable dose of rosuvastatin for a minimum of two months. The potential combination therapies that these patients may be on prior to the conversion will include: HMG-CoA reductase inhibitor and ezetimibe, fibrate, or a bile acid resin. Patients will be excluded if there is evidence of non-compliance before or after the conversion and if there are no labs within six months before or after the conversion.

Findings, Results or Conclusions

These will be presented at the conference.

Learning Objectives:

To determine the outcomes of patients switched from combination lipid lowering therapy to monotherapy with rosuvastatin.

To identify the benefits of mono versus combination lipid lowering therapy.

Self Assessment Questions:

True or False: The use of combination lipid lowering therapies can increase the risk of ADRs including an increase in liver function tests.

True or False: Patient adherence to their medication regimen is influenced by the number of medications that they take.

COMPARISON OF CLINICAL RESPONSES TO VANCOMYCIN STANDARD TROUGH LEVELS VERSUS HIGH TROUGH LEVELS FOR STAPHYLOCOCCUS AUREUS PNEUMONIA IN CRITICALLY ILL ADULTS

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Pneumonia is a frequent complication in hospitalized , particularly mechanically ventilated intensive care unit patients . Staphylococcus aureus is one of the most common causes of nosocomial infections. Vancomycin is a glycopeptide antibiotic commonly used to treat infections caused by Staphylococcus aureus, especially methicillin-resistant Staphylococcus aureus (MRSA). The optimal therapeutic range of vancomycin is commonly reported as a trough concentration of 5 to 10 mcg/mL. Previous studies have document poor penetration of vancomycin into the epithelial lining fluid (ELF) of the lungs, the site of infection in pneumonia. Moreover, studies have also reported poor cure rates of MRSA pneumonia with standard doses of vancomcyin. Theorectically, higher serum concentrations may improve patient outcomes by increasing pulmonary ELF concentrations. However, higher vancomycin concentrations may also result in greater risk of adverse effects, particularly nephrotoxicity. Therefore, the purpose of this study is to compare the efficacy and safety of high versus standard vancomycin trough concentrations for Staphylococcus aureus pneumonia in critically ill adults.

Methods include a retrospective chart review of critically ill adults who received intravenous vancomycin for the treatment of Staphylococcus aureus pneumonia. Patients will be categorized into two groups of standard (5 to 10 mcg/mL) versus high (> 10 mcg/mL) vancomcyin troughs based on concentrations achieved during the first four days of treatment. Clinical responses and nephrotoxicity will be assessed daily using a Clinical Pulmonary Infection Score (CPIS) and serum creatinine, respectively. Data collection is presently ongoing. Results will be presented at the Great Lakes Conference.

Learning Objectives:

To compare the clinical response of patients treated with standard vs. high trough vancomcyin for the treatment of Staphylococcus pneumonia.

To compare the incidence of nephrotoxicity in patients treated with standard vs. high trough vancomycin for the treatment of Staphylococcus pneumonia.

Self Assessment Questions:

True or False: Vancomycin concentrations in the epithelial lining fluid (ELF) of the lungs are equivalent to serum concentrations of vancomycin.

True or False: Patients with a vancomcyin trough > 10 mcg/mL have a higher cure rate of Staphylococcus aureus pneumonia than patients with the stand vancomycin trough of 5 to 10 mcg/mL.

PHARMACY BENEFIT COUNSELOR TELEPHONE SERVICE

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The purpose of this study was to determine member and health plan cost savings associated with a free telephone service designed to help members decrease out-of-pocket pharmacy costs.

The pilot program was implemented in various markets throughout the country based on the number of employees at each site. It was rolled out between the months of October 2004 and January 2005 and all employees enrolled into a Humana benefit plan were contacted via e-mail. Upon receiving a phone call, a licensed pharmacist, would record the employee's demographic information and review their pharmacy claims history to determine if any cost saving recommendations could be made. Recommendations included anything from generic equivalents of a brand product in a lower tier to different agents in the same therapeutic class for a disease state. Furthermore, employees were educated on how to successfully navigate through the Humana website to find information on out-of-pocket expenses. Pharmacy claims data will be evaluated every three months, to determine the member and plan cost savings for the suggested recommendations. Finally, a consumer satisfaction survey is currently being developed to record metrics, employee satisfaction and recommendations for improvement.

The program was launched in October 2004 to roughly 500 employees in various locations throughout the United States. To date, the program has been launched to roughly 7,500 associates with 20 utilizing members. Analysis will be conducted in the coming months to determine member and plan cost savings.

In conclusion this program has the potential to improve member satisfaction with the health plan, out-of-pocket costs, and member engagement through education on availability of on-line resources.

Learning Objectives:

What are the opportunities and barriers associated with implementing a consumer directed program aimed at helping consumers manage their out of pocket pharmacy related costs

To better understand the importance of consumer choice in managed care

Self Assessment Questions:

In general, consumers do not understand their pharmacy benefit and are unaware of prescription drug costs. T/F

There are many options available to consumers to lower out of pocket pharmacy costs. T/F

METHODS FOR CLINICAL SERVICES EVALUATION AT A TERTIARY ACADEMIC MEDICAL CENTER

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Background/Objective: Formal documentation of all clinical pharmacy services provided daily is not always feasible. Therefore, evaluating a clinical pharmacist's workload and corresponding maximum capacity of service units provided is difficult. The objective of this study is to describe two methods used for the evaluation of clinical pharmacy services at The Ohio State University Medical Center (OSUMC). In addition, results of the evaluation will be presented.

Methods: Two types of research methodology will be utilizedsed for this study. The quantitative method will involve a retrospective review of fiscal year data from 2000 to 2004 describing the number of inpatient days per year covered by each of six clinical pharmacist coverage areas. Using an acuity point system of patient care validated by an outside consulting firm, inpatient days in each coverage area will be converted to workload data for each clinical pharmacist. The acuity point system will then determine the service units that each clinical pharmacist can provide, assuming time spent for both patient and non-patient care duties. An evaluation comparing the current workload to the maximum capacity of service units provided by one clinical pharmacist will illustrate whether the demand for clinical pharmacy services exceeds the supply capacity of the current number of clinical pharmacists. Normal coverage and cross-coverage scenarios will be analyzed.

The qualitative method involves a survey of medical residents to determine their current level of expectations and perceptions regarding clinical pharmacy services provided at The OSUMC. Demographic data will also be collected via the survey for analysis.

Results/Conclusions: Preliminary results for a normal clinical pharmacist coverage scenario conclude that clinical pharmacists are currently over extended. This over-extension increases when cross-coverage is needed. Survey results are not available at the time of abstract submission. Results and conclusions will be presented in their entirety at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Understand the acuity point system of patient care in order to evaluate clinical pharmacy services

Gain insight into medical residents' expectations and perceptions of clinical pharmacy services

Self Assessment Questions:

How many acuity points are assigned per patient day for intensive care and non-intensive care patients?

For what clinical pharmacy service do medical residents have the highest expectation but the lowest perception?

PREEMPTIVE MANAGEMENT COMPARED WITH VALGANCICLOVIR PROPHYLAXIS FOR CYTOMEGALOVIRUS PREVENTION IN KIDNEY TRANSPLANT RECIPIENTS RECEIVING ALEMTUZUMAB INDUCTION

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Cytomegalovirus (CMV) is the most common opportunistic viral infection and a major cause of morbidity in solid organ transplant recipients. Valganciclovir, an antiviral agent effective against CMV, is widely used due to its comparable efficacy and improved bioavailability versus ganciclovir. Two strategies to prevent CMV disease, prophylaxis and preemptive therapy, have been studied. Prophylaxis, in which patients receive an antiviral for a specified time period, has the limitations of toxicity (leukopenia), cost, and emergence of resistance. With preemptive therapy, prophylaxis is targeted only toward patients at risk for developing CMV disease, based on serologic status and quantitative CMV polymerase chain reaction (PCR).

This retrospective cohort study compares preemptive and prophylactic strategies using valganciclovir for CMV disease prevention in kidney transplant recipients. All patients received a single 30mg dose of alemtuzumab intraoperatively and three days of intravenous methylprednisolone for induction. Maintenance therapy consisted of mycophenolate mofetil and tacrolimus without corticosteroids. Patients were divided into two cohorts. The first cohort of patients (n=100) received CMV prophylaxis with valganciclovir 450mg daily for three months. In the second cohort (n=100), patients were initially stratified based on CMV serologic status, a major risk determinant of infection. High risk patients, donor CMV-seropositive/recipient CMV-seronegative, received prophylaxis with valganciclovir 450mg daily for three months. Donor seropositive/recipient seropositive and donor seronegative/recipient seropositive patients were monitored by quantitative CMV-PCR every two weeks for three months. If the CMV viral load in peripheral blood was greater than the laboratory threshold, valganciclovir 450mg daily was initiated for one month or until blood was cleared of the virus. Incidence of leukopenia, infection/disease, rejection, and survival will be compared using relative risks and 95 percent confidence intervals. It is anticipated that there will be a decrease in leukopenia in the preemptively monitored patients and a comparable incidence of infection, rejection, and survival.

Learning Objectives:

Identify risk factors associated with the development of CMV infection in solid organ transplant recipients.

Compare and contrast risks and benefits associated with prophylactic and preemptive therapeutic strategies used in the prevention of CMV disease in solid organ transplant recipients.

Self Assessment Questions:

CMV serologic status is a major determinant of infection risk. Which group of patients is at highest risk for CMV infection?
a. Donor negative/Recipient positive
b. Donor positive/Recipient positive
c. Donor positive/Recipient negative
d. Donor negative/Recipient negative
e. a and b

Which of the following can cause leukopenia?
a. Valganciclovir
b. Mycophenolate mofetil
c. Alemtuzumab
d. a and b
e. All of the above

IMPLEMENTING AN ORDER SET IN THE EMERGENCY DEPARTMENT FOR THE TREATMENT OF ACUTE DECOMPENSATED HEART FAILURE

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At our institution, there are approximately 660 admissions for acute decompensated heart failure annually, which is out number one diagnosis of patients admitted. The purpose of this study is to implement an acute decompensated heart failure (ADHF) order set for use in our emergency department. With the establishment of this physician order set, we hope to see an decrease in length of stay and overall reduction in hospital costs for this disease state.
Methodology: A MEDLINE search for literature and practice guidelines for ADHF was completed. Updated practice guidelines will not be available until February 2005. Therefore, an ADHF - ED order set was developed to encompass an early, goal directed treatment strategy based on our findings and local heart failure expert opinion. Education was provided to physician, nursing, and pharmacy staffs in order to facilitate implementation. Following the completion and implementation of this order set, a retrospective analysis was done. Data collection included patient demographics, renal function on admission, usage of the order set, time to first diuretic, time to first vasoactive agent , change in weight during hospital course, urine output in the first 24 hours of hospitalization, and length of hospital stay.
Preliminary Results/Conclusions: ADHF patients will be evaluated from January 5, 2005 through February 28, 2005. Preliminary data has shown minimal utilization of our order set. Education on its importance and availability is ongoing. Data collected will be analyzed and relationships between factors will be assessed upon completion of retrospective chart review. Experts believe that initiation of early, goal-directed therapy is necessary to decrease length of stay and rate of readmission in ADHF patients.

Learning Objectives:

To discuss the use and early initiation of commonly used drug therapies and its relationship to length of hospital stay

To discuss the barriers encountered in the development and implementation an emergency department order set for acute decompensated heart failure

Self Assessment Questions:

T/F: Nesiritide should be used for ALL patients admitted to the hospital with ADHF.

T/F: Continuous loop diuretic administration is supported by evidence that ADHF patients are usually diuretic-resistant.

EVALUATION OF PROPHYLACTIC ANTIMICROBIAL SELECTION AND DURATION FOR SURGICAL PROCEDURES

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Surgical site infections are the most common nosocomial infections in surgical patients and one of the most common infections in hospitalized patients. They result in greater antibiotic use, more ICU admissions, greater length of stay, and increased cost of care. Antimicrobial prophylaxis has been shown to decrease infection rates in surgical patients. Several guidelines have been published detailing recommendations for the prevention of various surgical site infections.

The Centers for Disease Control and Prevention along with the Centers for Medicare and Medicaid Services have developed a project that is working to improve compliance with these guidelines. With this project under way, observation of Parkview Hospital's surgical prophylaxis procedures was initiated. By analyzing antimicrobial use, pre-operative timing, and post-operative duration, it can be determined if compliance with current guidelines is achieved.

The use of antimicrobials for surgical prophylaxis was observed in randomly selected surgical procedures in patients 18 years of age and older from November 2004 – January 2005. Antimicrobial selection, dose, timing, and duration were the primary outcomes measured.

Preliminary results show that agent selection for surgical prophylaxis was often in accordance with recommendations. However, pre-operative timing and post-operative duration of use are appropriate in approximately 50% of procedures. Half of overweight/obese patients receive larger doses of agents, and rarely were surgical procedures lasting greater than four hours re-dosed.

Full results and conclusions are to be presented at the conference.

Learning Objectives:

Assess current recommendations for surgical antimicrobial prophylaxis

Evaluate data for trends in surgical procedures which may show divergence from current practice recommendations

Self Assessment Questions:

Surgical site infections are the most commonly acquired nosocomial infections among surgical patients. T or F

It is recommended to continue prophylactic antibiotics until all tubes and lines are removed from the patient. T or F

BIOLOGIC ANTICANCER TREATMENT DOSE ROUNDING

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The use of biologic anticancer agents has advanced the treatment of malignant disease. The Spectrum Health formulary contains numerous biologic anticancer agents. Dosing of biologic anticancer agents is generally based on a patient's body surface area or weight rather than a fixed amount. This may generate drug wastage when the calculated dose slightly exceeds the amount of drug per vial. Wastage is undesirable because biologic anticancer agents are generally expensive and may be difficult to purchase. Furthermore, many biologic anticancer treatments are used infrequently and preservative free, which does not allow for batch preparations.

The primary objective was to determine cost savings related to the development and implementation of dose-rounding guidelines for biologic anticancer agents.

Development included evaluation of the medical literature, product reviews, and product labeling for pertinent pharmacokinetic, safety and efficacy information relevant to development of dose-rounding guidelines. Identification of products for dose rounding was based on acquisition cost, drug availability, dosing methods, and pharmacokinetic/pharmacodynamic properties. Biologic anticancer agents that met criteria were aldesleukin, bevacizumab, cetuximab, denileukin difitox, gemtuzumab ozogamicin, rituximab, and trastuzumab. Implementation required departmental and clinical section review and endorsement, approval by the Pharmacy and Therapeutics Committee (P & T), and staff education.

Based on reported pharmacokinetic and pharmacodynamic properties of the biologic anticancer treatments studied, dose rounding by ± 10% is not expected to negatively impact the efficacy or safety of therapy. The pharmacy department utilizes a P & T approved procedure for rounding the ordered dose by ± 10% of certain expensive parenteral products to reduce drug wastage. The aforementioned biologic anticancer agents were recommended for inclusion in the pre-existing procedure. The Clinical Oncology Section and the P & T committee approved this recommendation.

A dose-rounding procedure will reduce cost associated with biologic anticancer agents. Cost savings data to be presented.

Learning Objectives:

To identify the process of implementing dose-rounding guidelines at Spectrum Health

To list the criteria for drug selection and inclusion in the dose-rounding guidelines

Self Assessment Questions:

Surface area and weight based dosing does not yield consistent systemic drug exposure due to:
A. Pharmacodynamic properties of biologic anticancer agents
B. Pharmacokinetic inter-patient variability of biologic anticancer agents
C. Mechanism of action of biologic anticancer agents
D. Biologic characteristic's of a patient's cancer

T/F Spectrum Health has a P & T approved procedure for rounding the ordered dose by £ 10% for biologic anticancer agents.

DEVELOPMENT OF A PHARMACISTS BASED PAIN MANAGEMENT TEAM

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Purpose: Pain is a prevalent problem in our society and is a difficult problem to medically manage. One of the challenges with the management of pain is the lack of objective measures. To further complicate issues, practitioner and patient's attitudes toward pain may act as barriers to proper management. Community Health Network is a five-hospital acute-care health network with a well-established clinical pharmacy service and many drug therapy protocols. Multiple recent requests of pharmacy to manage pain therapy have generated interest in the creation of a pain management team.

Methodology: A survey of the pharmacists within the Community Health Network was conducted. Data about perceived barriers to pain management, previous experience with pain management and comfort level with pain management was collected.

Development of the PMT will involve establishing goals, determining which pharmacists will serve on the team and providing education about pain management. A process to be executed once a pain consult is received will be determined.

Use of the service will be monitored after its implementation. Frequency of consults, patient pain outcomes, and physician feedback will be used to assess the PMT.

Results: Preliminary results indicate the main perceived barriers to be: (1) Pharmacists' discomfort with pain management, (2) Lack of pain management guidelines/protocols, and (3) Conservative prescribing practices. The percentage of pharmacists that ranked these areas as being very much a barrier to pain management were 36%, 36% and 29%, respectively. There was also a trend of pharmacists with more years of practice to be less comfortable with completing a pain consult.

Conclusions: Survey results indicate the need for education. Four pharmacists have been selected to manage all pain consults. These pharmacists will be provided pain management educational opportunities. The results of the impact of the PMT are pending.

Learning Objectives:

Identify the barriers to the development of a pain management team.

Describe the process of developing a pharmacists-based pain management team.

Self Assessment Questions:

Pharmacists with the most years of practice are most comfortable with the management of pain. True or False

Pain is poorly controlled within the inpatient population. True or False

EVALUATION OF HYPOGLYCEMIC EPISODES IN HOSPITALIZED END-STAGE RENAL DISEASE PATIENTS ON GLARGINE

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Background/Objective: The kidney plays an important role in glucose regulation by metabolizing and excreting exogenous insulin. As glomerular filtration rate (GFR) decreases in patients with chronic kidney disease, insulin clearance decreases, the half-life of insulin increases, and overall insulin requirements decline. Therefore, insulin-dependent diabetic patients with end-stage renal disease (ESRD) are at risk for hypoglycemia, particularly those treated with longer acting insulin preparations. Glargine is a long-acting recombinant preparation that provides a continuous level of insulin. Since it mimics the steady basal secretion of insulin provided by the pancreas, glargine is commonly added to diabetic treatment regimens. The objective of this study is to evaluate the episodes of hypoglycemia in hospitalized patients with ESRD on glargine.

Methods: Patients admitted to the nephrology service at The Ohio State University Medical Center (OSUMC) between July 2003 and July 2004 will be evaluated. Sixty ESRD patients on dialysis will be included in the study if they were treated with glargine during the hospitalization. Data to be collected will include past medical history, home and hospital antidiabetic regimens, Accucheck® and lab blood glucose readings, recorded signs of hypoglycemia (glucose less than 65 mg/dL), and treatment interventions for hypoglycemia.

Results: Approximately 15% of patients with ESRD admitted to the nephrology service each year are treated with glargine during their hospitalization. Preliminary data (n=6) show that 50% of ESRD patients on glargine experienced at least one hypoglycemic episode. Of 204 Accucheck® readings analyzed, 8% were less than 65 mg/dL.

Conclusions: Preliminary results demonstrate that hospitalized ESRD patients treated with glargine are at risk for hypoglycemia.

Learning Objectives:

Determine if hospitalized patients with end-stage renal disease treated with glargine are at risk for hypoglycemia.

Recommend dosing and treatment regimens for hospitalized end-stage renal disease patients who become hypoglycemic on glargine.

Self Assessment Questions:

Exogenous insulin is not eliminated by the kidney. True or False

Glargine is a long-acting insulin preparation that is characterized by a peakless effect over 24 hours. True or False

ANALYSIS OF DRUG SUSCEPTIBILITY IN STAPHYLOCOCCAL INFECTIONS

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Linezolid was FDA approved four years ago as an agent to treat resistant gram-positive infections. Recent literature suggests superiority to standard therapy in the treatment of methicillin resistant staphylococcus aureus (MRSA) ventilator associated nosocomial pneumonia. There have been reports of linezolid resistance to MRSA, methicillin resistant staphylococcus epidermidis (MRSE) and vancomycin resistant enterococcus (VRE). Based on the potential for increased use and possible resistance, drug susceptibility and risk factors for resistance will be reviewed for patients with documented MRSA infections.

The primary objective of the research will be to determine the prevalence of MRSA where the linezolid minimum inhibitory concentration (MIC) is 4 ug/mL or greater, and to search for risk factors including prior antibiotic exposure that may explain the decrease in staphylococcal susceptibilities.

The study will be a retrospective chart review of patients with documented MRSA infections identified at The Ohio State University Medical Center. Data examined will include microbiologic data, antibiotic exposure and additional risk factors that include: length of hospital stay, previous hospitalizations or exposure to long-term care facility, diabetic, end-stage renal dialysis patient, decubitis ulcer, or infection where long term antibiotic therapy was warranted.

Data collection is in progress and the analysis of results is pending

Learning Objectives:

Discuss growing resistance trends in patients with staphylococcal infections.

Evaluate the importance of susceptibility testing in patients with treatment resistant infections.

Self Assessment Questions:

List two risk factors associated with developing resistance to antibiotics.

What is a desirable minimal inhibitory concentration (MIC) for linezolid in staphylococcal infections?

MEDICATION RECONCILIATION EVALUATION: COMPARISONS OF MEDICATION HISTORIES, ADMISSION ORDERS, AND PROBLEM LISTS DOCUMENTED IN THE ELECTRONIC MEDICAL RECORD

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The overall objective of this project is to measure the extent of medication reconciliation and to identify opportunities for improvement in the process. Obtaining an accurate and complete medication history is a critical part of patient assessment during the hospital admission process to ensure proper medication prescribing. Medication errors can result from an incomplete or inaccurate medication history that is subsequently used to generate the medication regimen during hospitalization. Medication reconciliation is a process to ensure that the patient is receiving the correct medications upon admission, transfer, and discharge from a hospital based on the patient's medication history. The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) proposed to accurately and completely reconcile medications across the continuum of care as one of the 2005 National Patient Safety Goals. In addition, JCAHO developed a medication management standard indicating that only medications needed to treat the patient's condition are ordered. Likewise, one of the American Society of Health Systems Pharmacists' 2015 goals is to have pharmacists acquire medication histories at admission for 75% of patients with complex regimens.
A retrospective chart review was performed on a random sample of medical and surgical patients admitted during a one month time frame. The chart review consisted of a comparison of medications taken by the patient prior to admission to orders upon admission and at 24 hours. Admission orders were also evaluated with their documented medical problems. When a variance was detected in the comparison, it was evaluated by a panel consisting of three pharmacists and a physician.
Data collection is currently ongoing with data analysis pending.

Learning Objectives:

Understand medication reconciliation and its impact on patient safety

Describe how medication reconciliation can be accomplished in a computerized physician order entry environment

Self Assessment Questions:

True or False: One of the American Society of Health-System Pharmacists (ASHP) 2015 goals is to increase the extent to which pharmacists help individual hospitalized patients achieve the best use of medications.

True of False: Obtaining an accurate and complete medication history is one method to prevent medication errors.

THE ROLE OF CONTINUOUS NERVE BLOCK FOR POSTOPERATIVE PAIN CONTROL

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Background: Postoperative pain is a major concern in hip and knee replacement surgery. Continuous peripheral nerve blocks (CNPB) are useful in providing both surgical anesthesia and postoperative analgesia. Studies have shown that use of continuous brachial plexus block after shoulder surgery decreases post-operative pain, opioid use, and side-effects related to opioids. There are currently no studies evaluating the effects of continuous peripheral nerve block in patients' status post hip-replacement surgery.

The primary objective of this study is to determine if the addition of ropivicaine continuous peripheral nerve block post-surgically decreases: the use of opioids, individual pain scores, complications secondary to opioid use, time to physical / occupational therapy, or length of stay, in patients undergoing hip replacement surgery.

Methods: Retrospective review of patients undergoing hip-replacement surgery receiving ropivicane continuous peripheral nerve block in comparison to patients not receiving a continuous peripheral nerve block. Patients will be included in the study if they underwent hip-replacement surgery at University Hospitals East between December 2003 and August 2004. Exclusion criteria include prior joint replacement, opioid dependence, or opioid addiction. Data will be collected using existing medical records and will include: pain scores, use of oral / intravenous opioids, complications secondary to opioid use, timing to physical / occupational therapy, and length of stay.

Results/Conclusion: Data collection and evaluation of the primary endpoints is currently being conducted and will be presented at the Great Lakes Pharmacy Conference.

Learning Objectives:

1.Describe the potential benefits of using continuous peripheral nerve block in patients' status post hip replacement surgery.

2.Explain the principles of a continuous peripheral nerve block.

Self Assessment Questions:

1.Continuous peripheral nerve block in status-post hip replacement patients decreased the use of oral and/or intravenous opioid medications. T or F

2.The Accufuser® ambulatory infuser system delivers ropivicaine by delivering:
a. a basal infusion
b. patient controlled bolus dosing
c. a basal infusion and patient-controlled bolus dosing

RETROSPECTIVE SURVEILLANCE OF ANTIMICROBIAL USAGE FOR THE TREATMENT OF PNEUMONIA IN A MEDICAL INTENSIVE CARE UNIT

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Pneumonia is a common source of infection in patients admitted to the Medical Intensive Care Unit (MICU), resulting in significant morbidity and mortality. These include prolonged mechanical ventilation, prolonged ICU length of stay (LOS), and prolonged hospital LOS. Several studies have proven that providing appropriate initial antimicrobial therapy for pneumonia results in improved morbidity and mortality. When selecting specific antimicrobials for empiric treatment of pneumonia, it is important to consider local resistance patterns. Currently in the Medical Intensive Care Unit (MICU) at University Hospital, no guidelines exist in regards to the treatment of pneumonia. The current antibiogram only reports resistance patterns for the hospital; therefore, unit specific resistance patterns are currently unknown. The purpose of this study is to identify trends in empiric antimicrobial selection for the treatment of pneumonia in the MICU at University Hospital, to evaluate whether antibiotic therapy is being changed appropriately based on culture results, and to identify resistance patterns for the MICU.

A retrospective chart review of all patients > 18 years of age admitted to the MICU from April 2004 through March 2005 that were treated for pneumonia is being conducted. Patient demographics, type of pneumonia, antimicrobial agents utilized, pertinent laboratory data, microbial culture results, clinical signs and symptoms of pneumonia, ventilator days, hospital and ICU LOS, and mortality data is being collected from computerized patient records and patient charts. Descriptive statistics will be employed to analyze the data.

Data collection is currently in progress. The results will be utilized to optimize empiric antimicrobial selection for the treatment of pneumonia in the MICU at University Hospital.

Learning Objectives:

Discuss the morbidity and mortality associated with pneumonia in critically ill patients.

Understand the importance of providing appropriate initial antimicrobial therapy for the empiric treatment of pneumonia.

Self Assessment Questions:

Pneumonia is associated with:
a. prolonged mechanical ventilation
b. prolonged ICU LOS
c. prolonged hospital LOS
d. all of the above

Initial appropriate antimicrobial therapy for the treatment of pneumonia is not associated with improved mortality. T or F

COMPARISON OF PATIENT SATISFACTION FOR THREE TRIPTANS FOR THE TREATMENT OF MIGRAINE HEADACHES

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Objective: The primary objective is to compare patient satisfaction with migraine relief from three different triptans medications, eletriptan, sumatriptan and zolmitriptan. A second objective is to compare the impact of migraine relief on the patient activities of daily living.

Methods: This is a prospective, multi-center, investigator blinded, randomized crossover study. Patients must be at least 18 years of age, experience a minimum of two migraine headaches per month and currently taking a triptan to be included. Patients are not eligible for the study if they have allergy or contraindications to triptans, failed one of the study medications, have a history of CVA, uncontrolled hypertension, pregnancy or trying to become pregnant. After enrollment, patients will randomly receive one of three triptans. At one month or three migraine headaches, whichever comes first, patients will receive the second and third triptan for each subsequent month until all patients have experienced each of the three migraine medicines. Patients are instructed to take the medication at the onset of a headache. They may repeat a second dose in two hours if they experience insufficient relief. Patients may take their usual rescue medication such as Motrin, Midrin, Tylenol or Vicodin, if they continue to experience symptoms after two doses of the triptan. Through a scorecard provided to the patient, each migraine medication is evaluated with reference to the quality of headache relief, influence on daily activities, and whether the patient would use the medication again if they had a choice. Appropriate statistical tests will be used to determine patient preference for each triptan studied. Thirty patients will be enrolled to have an 80% power to detect a difference between the triptans.

Preliminary results and conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:

Discuss any recent literature that may suggest that one migraine agent maybe superior to another.

Discuss the results of our study and how it will change management of migraine headaches.

Self Assessment Questions:

Which triptan is the initial treatment of choice for migraine headaches?

Does the pharmacokinetic property of a triptan determine patient satisfaction with migraine relief?

EVALUATION OF BISPHOSPHONATE USE IN CANCER PATIENTS

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Introduction: Bisphosphonates play an important role in the management of cancer patients. Pamidronate and Zoledronic Acid are two bisphosphonates that were approved by the Food and Drug Administration for the management of hypercalcemia and metastatic bone disease in cancer patients. In 2003, the drug expenditure of Pamidronate and Zoledronic Acid was about $12 millions at Harper University Hospital. Since these bisphosphonates are expensive agents, it is necessary to evaluate the use of these agents at our hospital.
Objectives: The objective of this study is to assess the appropriate use and safety of Pamidronate and Zoledronic acid in cancer patients.
Methodology: Prior to commencement, the investigators submitted a research protocol to the Institutional Review Board (IRB). The study was approved by the IRB and data collection is ongoing. This is a retrospective study to conduct a critical analysis of bisphosphonate use in cancer patients, including therapeutic indications, dosing regimen, and treatment duration. Patients who received pamidronate or zoledronic acid from April 2004 through June 2004 were identified from the pharmacy database. The data collection includes: patient's diagnosis, height, weight, age, serum creatinine, calcium, albumin, bisphosphonate regimen and indication. Also, side effects possibly due to bisphosphonate use will be reviewed and reported. The estimated sample size for this study is 75-150 patients. The investigators will evaluate the collected data for appropriateness and safety. Based on the results of this study, practice guidelines will be developed and implemented to improve the appropriate use of bisphosphonates.
Results and conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:

To understand the current role of bisphosphonates in the management of cancer patients.

To identify the role of pharmacists in monitoring bisphosphonate use.

Self Assessment Questions:

Which of the following monitoring parameters are necessary with bisphosphonate therapy?
a)Serum creatinin
b)Electrolytes (potassium, magnesium, calcium)
c)Liver function tests (AST/ALT)
d)A and B only

Bisphosphonates decrease serum calcium level by enhancing renal calcium excretion. True / False

ASSESSMENT OF THE IMPACT OF EDUCATION ON ASEPTIC TECHNIQUE IN TWO COMMUNITY HOSPITALS

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Objectives

1. To identify errors that could possibly contaminate sterile preparation during compounding
2. To evaluate contamination risk with growth medium fill-tests
3. To provide didactic instructions to compounding personnel on aseptic technique
4. To correct common mistakes and misconceptions regarding sterile compounding
5. To implement an improvement process to prevent harm and fatality to patients from microbial contamination
6. To measure the impact of education based on the rate of microbial contamination and performance on exam before and after personnel education

Methods

Phase 1

• All IV room compounding personnel at the two St. Luke Hospitals are required to perform an initial media-fill test and a written exam.

Phase 2

• IV room compounding personnel who have completed initial testing are required to watch the updated edition of Compounding Sterile Preparations Video Training Program produced by ASHP and read the “Aseptic Compounding” chapter from the Pharmacy Technician Training Manual published by ASHP.

Phase 3

• IV room compounding personnel perform a second media-fill test using the same test kit and re-take the written exam.
• The aseptic technique of each person is evaluated based on the results of the media-fill test and the written exam.

Phase 4

• Statistical analysis is conducted to assess the difference in microbial contamination rates and performance on the written exam before and after didactic education.

Results

• Data collection is on-going.
• Results will be presented once data is collected through the study time endpoint.

Learning Objectives:

Become familiar with the personnel training and evaluation requirements of USP Chapter 797

List the common mistakes that may compromise the sterility of products compounded in the laminar airflow workbench

Self Assessment Questions:

What are the gaps between the USP <797> requirements and the current practice at my institution?

What action can I take to fill-in these gaps?