USE OF VITAMIN B12 IN THE MANAGEMENT OF NEUROPATHIC PAIN IN PATIENTS WITH DIABETIC CHRONIC KIDNEY DISEASE

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Background: Neuropathic pain is a chronic pain condition resulting from injury to the pain conducting nervous system. Diabetic neuropathy is one of the most common types of neuropathies in the western world. Improving glycemic control helps delay development or reduces progression of this painful condition. However, if euglycemia is not achieved, then medication therapy is often needed. Many drugs have been used to treat the symptoms of diabetic neuropathy. These medications either have limited effectiveness or have intolerable side effects. In many countries, vitamin B12 has been used. However, in United States, experience has been limited. Limited studies demonstrate the effectiveness of vitamin B12 in improving neuropathic pain. These studies were conducted outside United States. Some of these studies had insufficient sample size or lacked good outcome measures. In these trials, methylcobalamin was used in various doses and various routes of administration. Cyanocobalamin and hydroxocobalamin are the only available vitamin B12 products in the United States.
Purpose: The present study will evaluate the short-term efficacy and safety of high dose, oral cyanocobalamin in the treatment of diabetic neuropathic pain.
Methodology: This study will be double blind, placebo controlled. Diabetic peripheral neuropathy patients greater than 18 years of age with chronic kidney disease and have minimum pain score of four on the eleven-point Likert scale will be recruited. Patients will be randomly assigned to either cyanocobalamin 2 mg or placebo orally each day for three months. Neuropathic pain will be assessed by Short-Form McGill Pain Questionnaire, Pain Rating Face Scale, and modified Brief Pain Inventory. Pain symptoms will be recorded and assessed at the onset of the study and each month of participation. Safety issues and compliance will also be addressed at these times.
Results: Pending.
Conclusion: Pending.

Learning Objectives:

Describe treatment used to improve the symptoms of neuropathic pain in diabetic chronic kidney disease patient.

Describe the role of vitamin B12 in neuropathic pain treatment

Self Assessment Questions:

What is the most important factor to control diabetic neuropathic pain?

What is the potential role of vitamin B12 in the treatment of diabetic neuropathic pain?

ECONOMIC EVALUATION OF BIVALIRUDIN OR GLYCOPROTEIN IIB/IIIA INHIBITORS PLUS HEPARIN FOR PERCUTANEOUS CORONARY INTERVENTION

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PURPOSE: Complications such as ischemia and bleeding episodes account for a major portion of all in-hospital costs during a percutaneous coronary intervention (PCI). Due to the use of glycoprotein IIb/IIIa inhibitors plus heparin during PCI the incidence of ischemic episodes has decreased. Therefore, bleeding episodes are now the most common and costly complication during PCI. Bivalirudin, a direct thrombin inhibitor, has been shown to be statistically not inferior with regard to efficacy when compared to heparin plus glycoprotein IIb/IIIa inhibitors. In addition, bivalirudin is associated with fewer bleeding complications in patients undergoing PCI. The primary objective of this study is to compare estimated in-hospital costs for patients receiving bivalirudin to those receiving heparin plus glycoprotein IIb/IIIa inhibitors for PCI. The secondary objective is to determine the impact of bleeding complications on the cost of PCI.
METHODS: A retrospective review of hospital billing data, from January – June 2004, will be performed in patients who received adjunctive therapy for PCI. The following data will be collected: total hospital costs and costs associated with bleeding complications including additional laboratory tests, room charge for extended length of stay, transfusion costs and use of therapeutic agents. Hospital costs will be determined by applying the institution's specific cost-to-charge ratio in 2004.
RESULTS/CONCLUSIONS: Data collection is in the process. Results and conclusions of the study will be presented at the conference.

Learning Objectives:

Determine the difference between estimated in-hospital costs for patients receiving bivalirudin to those receiving heparin plus glycoprotein IIb/IIIa inhibitors for PCI.

Quantify the impact of a bleeding complication on the cost of PCI.

Self Assessment Questions:

Bleeding is the most common complication during PCI as well as the most costly complication. 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 complications in patients undergoing PCI. T/F

ADHERENCE TO BEERS CRITERIA RECOMMENDATIONS FOR POTENTIALLY INAPPROPRIATE MEDICATION USE IN THE ELDERLY POPULATION IN A COMMUNITY HOSPITAL SETTING

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Thirty percent of hospital admissions of elderly patients may be linked to drug-related problems or toxic drug effects. In the absence of guidelines for safe medication use in the elderly, Beers criteria was developed as one approach to lower the incidence of adverse drug reactions (ADRs) in this population. It is based on expert consensus developed through literature reviews and questionnaires evaluated by nationally recognized experts in geriatric care, clinical pharmacology, and psychopharmacology.

The primary outcomes of this study are to determine the incidence of inpatients aged 65 and older (1) admitted already taking potentially inappropriate medications prior to admission; (2) started or continued on potentially inappropriate medications; and (3) being discharged on potentially inappropriate medications. Secondary outcomes of this study are to determine the incidences of ADRs associated with selected medications upon admission, during hospitalization and upon additional emergency room visits.

This is a retrospective chart review. Subjects will be identified utilizing the inpatient database LASTWORD. Data were collected from July 2004 through June 2005. Patients were included if they were age 65 and older and admitted for more than 24 hours. Patients were excluded if they were admitted to the ICU or if they participated in an alcohol and drug treatment program. Medications to be reviewed were determined based on the (1) high severity of the associated ADRs , (2) the recommendation of absolute avoidance regardless of strength, daily allowance, or disease state, and (3) the high usage at the St. Luke's Hospitals based on pre-study analysis. The seven identified medications to be reviewed include: amiodarone, diazepam, diphenhydramine, meperidine, nitrofurantoin, immediate-release oxybutynin, and promethazine. The overall data collected will include medications PTA, while admitted and upon discharge as well as ADRs related to the identified medications while admitted or that result in subsequent emergency department visits.

Learning Objectives:

Describe the incidence of potentially inappropriate prescribing in elderly patients in a community setting.

Describe the incidence of adverse drug reactions related to potentially inappropriate medication use in elderly patients.

Self Assessment Questions:

There are guidelines for safe medication use in the elderly. T or F

Beers criteria lists medications that should absolutely be avoided in the elderly population. T or F

DEVELOPING A PROPOSAL FOR AN EMERGENCY DEPARTMENT PHARMACIST IN A LEVEL 1 TRAUMA CENTER

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Statement of Purpose:

Due to safety concerns with the dispensing of medications, the Emergency Department (ED), has become a focus area during Joint Commission on Accreditation of Healthcare Organizations surveys. Medication Management Standard 4.10 states that when on-site pharmacy services are available, a pharmacist must review all prescription orders unless a licensed independent practitioner controls the ordering, preparing, and dispensing of the medication; or in urgent situations when the resulting delay would harm the patient. Pharmacist involvement in the ED at The Ohio State University Medical Center is limited to review of medication orders that are not in Pyxis® (i.e. are dispensed from the pharmacy). The purpose of this project is to evaluate the activities that could be performed by a pharmacist, including but not limited to prospective review of medication orders and medication reconciliation. This information, in conjunction with determination of pharmacist resource requirements, will be used to provide workload justification for pharmacy services in a Level 1 Trauma ED.

Statement of Methods Used:

All Pyxis® activity data from July 1, 2005 (0000 hours) to July 31, 2005 (2359) was collected. Patient specific medication removals were reviewed to assess the number of first and subsequent doses removed. First doses were considered equivalent to a new medication order. Emergency room activity data was extracted from the ED information system (IBEX®). Data regarding potential involvement in cognitive and educational activities was collected via interviews with the nursing and pharmacy staff as well as from the literature.

Summary of Preliminary Results:

Data collected revealed that out of the 4,846 patient visits to the ED, 2,913 patients received medications from Pyxis®, resulting in an average of 2.7 medications administered to each patient.
Reviewing removal times of first doses revealed the busiest times of the day to be between noon and midnight.

Learning Objectives:

Discuss current literature describing the impact of an ED pharmacist.

Discuss JCAHO Medication Management Standard 4.1, and how an ED pharmacist can help meet the requirements of the standard.

Self Assessment Questions:

Which JCAHO initiatives can be positively impacted by having an ED pharmacist?
a. Medication Management Standard 4.1
b. National Patient Safety Goal 8
c. Core Measures (Community Acquired Pneumonia, Myocardial Infarction, Heart Failure, etc.)
d. All of the above

Which potential activities of an ED pharmacist could increase patient safety and quality of care?
a. Attending level 1 and 2 traumas
b. Attending cardiopulmonary resuscitation
c. Provide drug information
d. Provide in-service sessions for medical staff
e. All of the above

EVALUATION OF CARBOPLATIN DESENSITIZATION PROTOCOL IN CANCER PATIENTS

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Background:
Each year 25, 000 women are diagnosed with ovarian cancer in the United States. Ovarian cancer is the leading cause of death among gynecologic malignancies. Platinum-based (carboplatin) regimens are the cornerstone of ovarian cancer therapy due to their safety and efficacy. Many patients achieve complete remission upon initiation with a platinum-based regimen but later go on to develop recurrent disease within 3 years of diagnosis. The treatment for platinum-sensitive recurrent cancer (> 6 months disease-free period from last treatment) is a platinum-based regimen. An increased incidence of hypersensitivity reactions is seen with more than seven cycles of carboplatin. Harper University Hospital has implemented a four-step desensitization protocol for these patients.

The purpose of this study is to evaluate the tolerance and effectiveness of carboplatin rechallenge that uses a prolonged carboplatin desensitization protocol in patients with clinically documented carboplatin hypersensitivity reaction.

Methods:
In this retrospective study, patients received carboplatin desensitization infusion from January 2002 through December 2005 were identified by the computerized pharmacy records and reviewed through patient medical charts and electronic data. Data collection included age, sex, race, diagnosis, number of cycles until first hypersensitivity reaction, description of hypersensitivity reaction, total number of desensitizations received, number of desensitizations and type of hypersensitivity reactions experienced during desensitization, treatment for hypersensitivity reaction, and outcome. Data analysis will be performed through descriptive statistics.

Results/Conclusion:
The results and conclusion of this study will be presented at the Great Lakes Residency Conference.

Learning Objectives:

To discuss the rationale of carboplatin retreatment in patients with platinum-sensitive ovarian cancer.

To analyze the tolerance and effectiveness of utilizing a carboplatin desensitization protocol in patients with a history of carboplatin hypersensitivity.

Self Assessment Questions:

True/False: Carboplatin and paclitaxel is the cornerstone therapy for ovarian cancer.

True/False: Hypersensitivity reactions are usually experienced with more than seven cycles of carboplatin

CONTINUOUS INFUSIONS VERSUS INTERMITTENT BOLUSES OF MAGNESIUM FOR HYPOMAGNESEMIA IN CRITICALLY ILL PATIENTS

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Hypomagnesemia in the critically ill has been associated with arrhythmias, seizures, bronchospasms, hypertension, hypokalemia, hypocalcemia, and increased mortality rates. Magnesium distributes slowly intracellularly and is rapidly eliminated by the kidney. Rapid administration of magnesium leads to an initial high serum concentration, inadequate distribution intracellularly, and significant excretion in the urine. Limited data exists for adequate magnesium replacement protocols. Hence, a new 24 hour continuous infusion protocol has been developed at St. John Hospital and Medical Center (SJHMC) to facilitate adequate replacement of intracellular magnesium stores.
This study will evaluate the amount of time serum magnesium levels remain therapeutic (1.7 to 2.1 mEq/L), reoccurrence of hypomagnesemia, incidence of hypermagnesemia, and adverse events associated with hypomagnesemia or hypermagnesemia in patients receiving magnesium over 30 minutes per current SJHMC protocol as compared to patients receiving 24 hour continuous infusions per new protocol.
This is a prospective open-label comparative trial of 100 critically ill patients > 18 years of age with a magnesium level < 1.5 mEq/L in the surgical intensive care unit (ICU), cardiac ICU, and medical ICU at SJHMC between February 15th and April 1st 2006. Patients with serum creatinine > 1.5 mg/dl, creatinine clearance < 30 ml/min, on total parenteral nutrition, or length of stay < 24 hours will be excluded from the study. Fifty patients will receive magnesium over 30 minutes and fifty patients will receive 24 hour continuous infusions. Data will be collected on patient characteristics, number of consecutive days magnesium was 1.7 to 2.1 mEq/L, number of levels above or below 1.7 to 2.1 mEq/L, occurrence of adverse events associated with hypermagnesemia or hypomagnesemia, percent of potassium and calcium levels within normal range, and total amount of magnesium, potassium, and calcium used per patient.

Results and conclusions will be presented at the conference.

Learning Objectives:

Discuss the clinical implications of hypomagnesemia in critically ill patients.

Describe how 24 hour continuous magnesium infusions will facilitate adequate replacement of intracellular magnesium stores and prevent the reoccurrence of hypomagnesemia in the critically ill.

Self Assessment Questions:

Hypomagnesemia is associated with hypokalemia and hypocalcemia. True or False

Magnesium administered as rapid intermittent infusions will adequately replace intracellular magnesium stores. True or False

SAFETY OF MODERATE SEDATION / ANALGESIA IN PEDIATRIC PATIENTS UNDERGOING DIAGNOSTIC AND THERAPEUTIC PROCEDURES

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Purpose: Seriously ill pediatric patients often require diagnostic and therapeutic procedures. The use of moderate sedation/analgesia has become routine practice to relieve pain and anxiety, as well as control excessive movement during such procedures. A variety of drug regimens may be used, but should be tailored to the patient and procedure to be performed. Among the many sedative agents from which to choose, chloral hydrate, ketamine, and propofol, as single agents, or in combination with a benzodiazepine (e.g., midazolam) or an opiate (e.g., fentanyl) are commonly used. The exact incidence of adverse effects related to procedural sedation and analgesia is very difficult to determine and has been reported at various rates in the literature. This retrospective study will evaluate the current use, prescribing patterns, and safety of sedative/analgesic agents used for moderate sedation/analgesia in pediatric patients undergoing diagnostic and therapeutic procedures at an urban university medical center.

Methods: This project will be a retrospective study of pediatric patients (1 month to 21 years of age) who underwent a diagnostic and therapeutic procedure that required moderate sedation/analgesia between January 1st and December 31st 2005. Patients must have a completed sedation and analgesia record to be included. Those who required elective endotracheal intubation prior to procedure will be excluded. Data will be collected from the patient's medical record and the sedation and analgesia record. Data to be collected includes patient demographics, medications used, dosages, prescribing physician, hemodynamic parameters, changes in level of consciousness, adverse effects during and following procedure, use of reversal agents (e.g., naloxone and flumazenil), whether or not patients met discharge criteria, and reason(s) for not meeting discharge criteria.

Results/Conclusions: Results and conclusions will be presented at the Great Lakes Pharmacy Resident conference.

Learning Objectives:

List the different sedative/analgesic agents used for moderate sedation in the pediatric population.

Describe the adverse effects associated with sedative/analgesic agents used for moderate sedation in the pediatric population.

Self Assessment Questions:

Meperidine is the most commonly used agent for moderate sedation in the pediatric population. T or F

Propofol infusion has been associated with severe cardiovascular effects. T or F

ORAL BISPHOSPHONATES: AN EVALUATION OF TRANSCRIPTION AND ADMINISTRATION TRENDS

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Objective: Bisphosphonates have very specific instructions for dosage and administration. When bisphosphonates are not administered correctly, patients have minimal or no benefit from the drug, and are at increased risk for developing side effects. The purpose of this study is to evaluate the use of these agents based on a review of order transcription and administration, and to develop practice guidelines for pharmacists and nurses as well as patient education material. The principle behind this research is to optimize bisphosphonate use and to decrease actual and potential adverse drug events.

Methodology: A retrospective study is planned of patients administered oral bisphosphonates over a one year period between 2004 and 2005 from four hospital groups within the Detroit Medical Center. A review of the orders and medication administration records of medical charts will be conducted to determine actual time order entered in pharmacy and administration by nursing. The pharmacy medication database will be used to identify research participants. A master list that links the subject number to the subject's identity will remain confidential. Data collection will include time scheduled for administration, times administered, and other drugs administered concomitantly. The primary outcome is the percentage of doses given correctly. Secondary outcomes are the number of patients on bisphosphonates who are also on calcium and vitamin D for osteoporosis management and the number of patients that were on a bisphosphonate despite contraindications. The results of this study will serve as a guide in the development of an educational program for pharmacy and nursing concerning bisphosphonate therapy as well as patient education material.

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

Learning Objectives:

To evaluate the appropriateness of bisphosphonate use based on a review of order transcription and administration.

To establish and implement practice guidelines for pharmacists and nurses, as well as patient education material on appropriate bisphosphonate use.

Self Assessment Questions:

Bisphosphonates have very specific instructions for administration. Patients should be instructed to:
a. Take this medication with a full glass of plain water in the morning on an empty stomach
b. Stay fully upright for at least 30 minutes
c. Wait at least 30 minutes before taking the first food, drink, or other medications of the day
d. Take supplemental calcium and vitamin D if dietary intake is inadequate
e. All of the above

Which of the following contraindication(s) exist for bisphosphonate therapy?
a. Esophageal abnormality
b. Cannot sit or stand up for at least 30 minutes to 1 hour
c. Hypocalcemia
d. Severe kidney disease
e. All of the above

TIGECYCLINE FOR INTRA-ABDOMINAL INFECTIONS AND SKIN AND SKIN-STRUCTURE INFECTIONS

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Background:
The microbiology of intra-abdominal infections can be highly diverse including anaerobic, gram-negative, and gram positive organisms. Skin and skin-structure infections mainly involve gram positive organisms, however, in more severe, necrotic infections gram negative organisms and anaerobes may also be involved. Antibiotics utilized for both empiric therapy and treatment include the carbapenems (ertapenem, imipenem/cilastatin, meropenem) and piperacillin/tazobactam. These antibiotics can be used to treat many other infections and due to growing concerns of resistance at Bronson Methodist Hospital, physicians are turning to tigecycline, a new drug, for both empiric therapy and treatment of intra-abdominal infections and skin and skin-structure infections. Tigecycline is the first in a new class of antibiotics called glycylcyclines. The glycylcyclines are tetracycline analogs derived from minocycline that show the same spectrum of activity as tetracyclines. Tigecycline is a bacteriostatic drug with a mechanism that is similar to the tetracyclines. The major benefit of tigecycline is that it has activity against most tetracycline resistant organisms by overcoming the major resistance mechanisms.

Purpose:
The purpose of this retrospective study is to evaluate the safety and efficacy of tigecycline in Bronson patients.

Methods:
Patients that receive tigecycline from October 1, 2005 to March 15, 2006 will be reviewed. Patients will be identified via pharmacy dispensing records for tigecycline. The goal is to review twenty charts, ten intra-abdominal infections and ten skin and skin-structure infections, however all patients who receive tigecycline will be reviewed. Clinical outcomes, microbiological outcomes, and side effects will be recorded and assessed for tigecycline. Descriptive analysis will be used to evaluate the data.

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

Learning Objectives:

Given a patient with an intra-abdominal infection or a skin and skin-structure infection determine if tigecycline would be an effective treatment

Discuss the significance of the tolerability of tigecycline and how that may limit its use

Self Assessment Questions:

Tigecycline overcomes the major tetracycline resistance mechanisms. T/F

In clinical trials, tigecycline has not been associated with a high incidence of nausea and vomiting. T/F

CLINICAL OUTCOMES OF TIOTROPIUM THERAPY AT A VETERANS AFFAIRS FACILITY

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Purpose:
Tiotropium is a long-acting anti-cholinergic medication used in the treatment of chronic obstructive pulmonary disease (COPD). In the VA system, this medication is non-formulary and is prescribed to patients that meet restriction criteria. The purpose of this study will be to evaluate how well patients benefit from tiotropium therapy. Clinical factors such as urgent care visits, hospitalizations, albuterol refills for as needed use, outpatient prednisone use, and number of antibiotic courses will be analyzed to see how patient outcomes have been influenced by the use of tiotropium. In addition, veteran satisfaction with the inhaler and ease of use will be determined.

Methods:
This project has been approved by the Institutional Review Board. The study will consist of two parts: a retrospective chart review and a patient survey. Patients will be identified using the medical center's computer system. Demographic data such as smoking history, pulmonary function tests, Global Initiative for Chronic Obstructive Lung Disease stage, and oxygen use will be obtained from the chart review. The primary outcomes of the study will be the number of urgent care visits and number of hospitalizations pre- and post-tiotropium use. There will be separate analyses for urgent care visits and hospitalizations where COPD was the admission diagnosis and all-cause urgent care and hospital admissions. Secondary outcomes will include the number of outpatient albuterol refill for as needed use, antibiotic courses, and steroid burst prescriptions before and after initiation of tiotropium therapy. For the survey portion of the study, a survey will be mailed to patients who are prescribed tiotropium. The survey will consist of questions regarding perception of health, compliance, and ease of inhaler use.

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

Learning Objectives:

Identify the role of tiotropium in the treatment of COPD

Understand the differences between tiotropium and ipratropium dosing and administration

Self Assessment Questions:

Tiotropium is dosed:
a. one time daily
b. two times daily
c. three times daily
d. four times daily

True or False: Tiotropium is an inhaled corticosteroid.

PHARMACY RESIDENT ATTITUDES TOWARD PHARMACEUTICAL PROMOTION

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PURPOSE: Pharmaceutical industry promotional activities involving healthcare professionals are extremely prevalent. Research shows that physician-industry interactions are likely to influence physicians' prescribing and professional behaviors. Industry sponsored educational events have been associated with increased prescription rates. For this reason, some medical residency programs have developed educational programs that train medical residents to critically evaluate pharmaceutical promotion.

Research concerning pharmacist-industry interactions is less common than research concerning physician-industry interactions. Little is known regarding the effects of these interactions on the knowledge and practice of pharmacy residents. However, interactions between the pharmaceutical industry and pharmacy residents are growing. This study will investigate the opinions of pharmacy residents toward pharmaceutical promotion, and the effects it has on their attitudes and professional practice.

METHODS: An electronic, anonymous, multiple choice survey will be distributed to 500 general and specialty pharmacy residents via electronic means. Questions will investigate opinions regarding ethics and appropriateness of pharmaceutical industry promotion. They will also investigate opinions regarding industry-sponsored meals, educational events, gifts, and pharmaceutical sales representatives. In addition, questions will investigate the perceived influence that pharmaceutical promotion has on the professional knowledge and practice of pharmacy residents. Other questions will inquire whether pharmacy residency programs have policies or offer training regarding resident-industry interactions. Descriptive statistics and the Mann-Whitney U test will be used to report results.

RESULTS: Results are currently pending and will be presented at the meeting.

CONCLUSIONS: Information regarding pharmaceutical industry influence on pharmacy residents may help to determine whether educational intervention is necessary during pharmacy residency programs.

Learning Objectives:

Upon attending the presentation, participants will be able to discuss findings of previous research regarding the influence of pharmaceutical promotion on the professional behavior of physicians.

Upon attending the presentation, participants will be able to outline how some medical residency programs have helped to prepare medical residents to evaluate pharmaceutical promotion.

Self Assessment Questions:

True or false? Pharmaceutical industry-sponsored educational events aimed at physicians are associated with increased prescription rates of the respective medications.

True of false? Due to the influence of pharmaceutical promotion on physicians, some medical residency programs have developed educational programs that train medical residents to critically evaluate pharmaceutical promotion.

EMERGENCY PREPAREDNESS AND PHARMACY MOBILIZATION

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Objectives

The primary objective of this project is to evaluate and update the existing policy and procedure regarding emergency preparedness and response specific to the Pharmacy Department. To ensure that future execution of the plan is optimized and well coordinated with the Emergency Department and local plans, a table top drill will be conducted specific to the Pharmacy Department. Measures will be taken to ensure that an appropriate cache of pharmaceuticals are in stock and any additional needs will be readily retrievable. In order to ensure the advancement of ASHP 2015 initiative objective 6.5, appropriate documentation and subsequent publications will allow for increased awareness of the importance of instituting an emergency preparedness plan.

Methods

Existing Pharmacy Departmental plans will be examined and expanded as seen fit. This will be in coordination with the hospital wide plan for preparedness as well as local and federal plans. An organizational command plan will be included as part of the policies and procedures. An organizational plan specific to Rush will designate the appropriate chain of response during a disaster event. An emergency response team and specific roles will be identified. Since Rush is a housing site for the Chempack, it is imperative that the pharmacy department be adequately trained on the activation plan. In the hopes that our experience in implementing an emergency preparedness plans will be adaptable to other institutions, the results generated will documented for publishing and presentation purposes.

Results

Thus far, a “train the trainer” certificate was obtained from the Chicago Department of Public Health regarding the Chempack. This allowed for an inservice to be conducted, educating the Pharmacy Department on the components as well as the notification and activation of the Chempack. Development of an emergency preparedness resource center has yet to be completed. A table top drill is scheduled to be conducted this spring.

Learning Objectives:

Understand the specific role of the pharmacist in emergency preparedness.

Understand the components of the Chempack in addition to the notification and activation process involved.

Self Assessment Questions:

The Chempack is a subset of the Strategic National Stockpile and is monitored around the clock solely by the local department of public health. True or False

The Chempack contains atropine, pralidoxime, and diazepam. True or False

THERAPEUTIC INTERCHANGE BETWEEN ANGIOTENSIN II RECEPTOR BLOCKERS: A RETROSPECTIVE FORMULARY CONVERSION STUDY.

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Background: Formulary management is an ongoing process for government and private institutions, as well as third-party payors. The rationale behind this process is to provide comparable medications at the lowest possible cost. Recently, the Department of Veterans Affairs (VA) awarded its national contract to losartan as the preferred angiotensin II receptor blocker (ARB) for the treatment of hypertension. Prior to this contract, candesartan was the preferred ARB at Jesse Brown VA Medical Center (JBVAMC). Although both losartan and candesartan are indicated for the treatment of hypertension, studies suggest candesartan may possess greater blood pressure lowering effects than losartan when used at comparable dosages. Adverse event and tolerability profiles between the two agents appear similar. The purpose of this study is to assess the efficacy and safety of a formulary conversion from candesartan to losartan in controlled hypertensive patients at a VA Medical Center.

Methods: This study will be a retrospective chart review of hypertensive patients at JBVAMC converted from candesartan to losartan between October 1, 2004 and December 1, 2005. Only those patients with an average blood pressure of < 140/90 mmHg prior to formulary conversion will be selected for inclusion. Efficacy will be determined by evaluating blood pressure and heart rate both before and after ARB conversion, addition or deletion of anti-hypertensive agents post-conversion, and dosage increases of either losartan or other anti-hypertensive agents post-conversion. Safety will be determined by evaluating serum potassium and creatinine levels during treatment with both candesartan and losartan, as well as discontinuation rates and adverse events associated with losartan. In addition, this study will evaluate adherence to formulary protocol guidelines within JBVAMC.

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

Learning Objectives:

Assess the comparative level of blood pressure control in patients switched from candesartan to losartan.

Compare the safety profile of candesartan versus losartan.

Self Assessment Questions:

True or False: Losartan is indicated for the treatment of hypertension.

True or False: Previous studies have shown that candesartan 32mg daily has a significantly greater effect on lowering blood pressure when compared to losartan 100mg daily.

MEDICATION RECONCILIATION INITIATIVE

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Due to potential risks to patients at points of transition in care, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) has included medication reconciliation as a new National Patient Safety Goal (NPSG), requiring hospitals to accurately and completely reconcile medications across the continuum of care. Recently, medication reconciliation took on a greater significance when JCAHO issued a sentinel alert related to medication errors at interfaces of care. In order to ensure compliance with the NPSG, The Ohio State University Medical Center (OSUMC) launched an initiative with the goal of designing a standard process to reconcile medications upon admission, transfers, and discharge consistent with the NPSG requirements and recommendations from the Institute of Healthcare Improvements and The Massachusetts Coalition Group for the Prevention of Medical Errors.

The initiative was divided into three phases: 1) pre-implementation 2) implementation, and 3) post-implementation. Pre-implementation consisted of describing and flowcharting current processes used to collect medication histories, assessing system failures through an FMEA/RCA, obtaining baseline data about current performance, and developing medication reconciliation policies and procedures based on the recommendations from the FMEA/RCA results. The second phase involved the implementation of an enhancement to the clinical order entry system in a pilot unit. Post-implementation, yet to be completed, will consist of assessing outcomes and performance measures to compare against baseline data.

The main area of concern identified through the FMEA process is having multiple locations throughout the system to document home medications, leading to transcription errors, difficulty in updating information, and poor accessibility to information.

The FMEA process proved to be useful for evaluating the current process for medication reconciliation and determining areas where improvement efforts should be focused. The FMEA results revealed the difficulties in documenting medications upon admission and the need for a multidisciplinary approach to implement medication reconciliation throughout the organization.

Learning Objectives:

Understand the impact of medication reconciliation on patient safety.

Understand the value of a Failure Modes and Effect Analysis and a Root Cause Analysis for assessing risks and identify the areas most in need of process improvements.

Self Assessment Questions:

Medications should be reconciled when a patient is:
a. Admitted to an organization
b. Transferred within the organization
c. Discharged from the organization
d. All of the above

Describe common pitfalls of medication reconciliation

ADHERENCE TO MEDICATION USE EVALUATION CRITERIA AND IMPACT ON THE USE OF RECOMBINANT FACTOR VIIA (RFVIIA)IN THE SURGICAL INTENSIVE CARE UNIT

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Purpose: Recombinant Factor VIIa (rFVIIa)is indicated for the treatment of bleeding episodes in hemophilia A or B patients with inhibitors to factor VIII or factor IX. After vascular damage and local initiation of the coagulation cascade, rFVIIa enhances thrombin generation on the surface of activated platelets, resulting in the formation of a stable, lysis-resistant plug at the site of vessel injury. rFVIIa has also been successfully used to arrest intraoperative bleeding and reverse coagulopathies in patients undergoing surgical procedures. In the 2004-2005 fiscal year, the use of rFVIIa represented the second highest medication expense in the Surgical Intensive Care Unit (SICU) at The Ohio State University Medical Center. Medication Use Evaluation (MUE) criteria were approved for the use of rFVIIa by the Pharmacy and Therapeutics Committee in 2004. The objective of this study is to determine the adherence to MUE criteria approved by Pharmacy and Therapeutics Committee for rFVIIa in the SICU.

Methods: A retrospective chart review will be conducted on patients admitted to the SICU who received rFVIIa between January 1, 2005 and December 31, 2005. Patients excluded from the study will include prisoners, pregnant females, and patients less than 18 and greater than 89 years of age. Data collected will include age, gender, weight, and primary diagnosis. Drug specific data collected will include indication for recombinant factor VIIa, dose, and duration of treatment. Pertinent laboratory data collected will include hemoglobin, hematocrit, platelets, INR, PTT, fibrinogen, and factor VII level. Transfusion specific data collected will include type, dose, and timing of transfusion therapy. Other information collected will include baseline and hemostatic medications received during admission, need for return to operating room, and adverse events.

Results and Conclusions: The results and conclusions of this study are pending and will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Describe the current utilization of rFVIIa at The Ohio State University Medical Center

Understand the rationale behind the use of rFVIIa in arresting intraoperative bleeding and to reverse coagulopathies.

Self Assessment Questions:

T/F rFVIIa enhances thrombin generation on the surface of activated platelets, resulting in a stable, lysis-resistant plug and the site of vessel injury.

T/F rFVIIa has not shown to successfully arrest intraoperative bleeding in patients undergoing surgical procedures.

HEALTH LITERACY STATUS WITHIN AN ASTHMA POPULATION

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Background and Purpose: Asthma is associated with significant morbidity and mortality, despite considerable progress in the management of the disease. Pediatric asthma patients are especially affected by the burdens of asthma. One explanation is decreased health literacy among the caregivers (proxies) of pediatric patients. The primary objective of this study is to assess the level of health literacy in a population of proxies to pediatric asthma patients.

Methodology: In Community Health Network's Family Medicine Center, around 1100 patients are diagnosed with asthma, 600 of which being pediatric. Since April 2004, over 100 patients have been seen in a pharmacist-run asthma clinic located at this center. The center's electronic medical records system will be used to identify pediatric patients with asthma on a day-to-day basis. Data collection will involve administering the Rapid Estimate of Adult Literacy in Medicine (REALM) test to subjects over the age of 18 years who are a proxy of a pediatric patient with asthma. The data will be collected over the course of six months. We hypothesize that the results of this study will show a decreased level of health literacy in this population. If necessary, results of this study will be used to develop an individualized health literacy intervention or “toolkit” targeted for the proxy of the pediatric patient with asthma for pharmacists and other healthcare professional to use in a clinic setting.

Results: Preliminary results indicate an average REALM score of 57, which corresponds to a 7th to 8th grade reading level. Patients with a reading level of 7th to 8th grade can be expected to struggle with many patient education materials. They may be able to pronounce words but not fully comprehend the meaning.

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

Learning Objectives:

Understand the relationship between level of health literacy and healthcare outcomes.

Identify ways to assess health literacy of patients in order to target patient education.

Self Assessment Questions:

Low health literacy may result in all of the following except:
a. Reduced positive health behavior
b. Decreased disease and self-care knowledge
c. Less use of preventative and physician care
d. Lower compliance with medications
e. All of the above

The Rapid Estimate of Adult Literacy in Medicine (REALM) test is a word recognition test that can provide valuable information about a patients reading comprehension ability. True or False?

INCIDENCE OF DOCUMENTATION OF ADVERSE DRUG EVENTS IN SUBJECTS WITH MULTIPLE PRESCRIPTIONS IN THE AMBULATORY CARE SETTING

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The incidence of adverse drug events vary greatly in the literature and this may be due to a variety of reasons, including poor communication, not realizing that there is an adverse event, and poor documentation. Detecting ADEs is a key element in the Medication Therapy Management Program (MTMP) at University of Illinois at Chicago (UIC). The MTMP clinic at UIC regularly sees patients that are on multiple medications and have difficulty with the self management of medications secondary to adherence problems or due to lack of understanding or knowledge of chronic medication. The primary objective of this study is to determine the incidence of adverse drug events in subjects who are taking more than 6 medications and are seen in the ambulatory care setting. The secondary objective is to compare the difference in the documentation of adverse drug events between physicians and pharmacists. This is a retrospective chart review of 150 patients seen at the Medication Therapy Management Services Clinic at UIC from January 1, 2002 to December 31, 2004. The data collected from the PharmD notes will be compared to the data collected from the MD notes. Charts will be reviewed of all subjects over the age of 18, on a minimum of 6 chronic prescription medications, receiving these medications from UIC Ambulatory Care Pharmacy (PCC) for at least 6 months, and visiting a physician at one of the UIC clinics regularly. Charts will not be reviewed of any subject under the age of 18, with psychiatric conditions, or on less than 6 chronic medications. Results and conclusions are pending.

Learning Objectives:

Determine the incidence of adverse drug events in patients who are seen in the ambulatory care setting and are taking multiple medications.

Compare the difference in the documentation of adverse drug events between physicians and pharmacists.

Self Assessment Questions:

True/False: There is only one definition of adverse drug events.

True/False: The overall incidence of adverse drug events in the ambulatory care setting is well established and documented.

EVALUATION OF ANTICOAGULANT DOSING FOR VENOUS THROMBOLIC EVENT (VTE) PROPHYLAXIS IN POST-SURGICAL GASTRIC BYPASS PATIENTS

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Purpose: Post-surgical gastric bypass patients present a challenge with regard to their VTE prophylaxis because most medications currently approved for prophylaxis have not been well studied in this population. Additionally, obesity is thought to be a risk factor for VTE, however this remains controversial due to lack of evidence. The optimal agent for prophylaxis has yet to be defined. The questions of which agent to use, as well as dosing, have yet to be answered by well designed clinical trials and/or consensus guidelines. The objective of this review is to characterize anticoagulant use and dosing for VTE prophylaxis in post-surgical gastric bypass patients as well as evaluate adverse events.

Methods: A six month retrospective chart review, from January 2005-June 2005, will be performed in post-surgical gastric bypass patients. Charts will be reviewed for demographics (age, gender, weight, height) pertinent lab values (BUN, serum creatinine, hemoglobin, hematocrit, platelets, INR, PTT, anti-Xa levels) concomitant medications that may effect bleeding (aspirin, clopidogrel, warfarin, heparin, or NSAIDs) and risk factors for development of DVT. Post-surgical data collection will include type and dosage of prophylactic agent, confirmed VTE, development of heparin-induced thrombocytopenia or thrombocytopenia, number of transfusions and any bleeding event. A major bleed will be defined as documented cerebrovascular, gastrointestinal or retroperitoneal bleed, use of transfusions, or drop in hemoglobin > 2gm/dL. A minor bleed will be defined as ecchymosis, epistaxis, hematuria, hematoma, hemoptysis, or petechiae without drop in hemoglobin > 2mg/dL.

Results: Data collection is in process. Data analysis, results, and conclusions will be presented. Data will be analyzed using descriptive statistics to determine incidence of any VTE and bleeding complications.

Learning Objectives:

To evaluate current practice of venous thrombolic event prophylaxis in obese, post-surgical patients.

Assess adverse events associated with prophylactic agent and dosage of agent

Self Assessment Questions:

There is good data from clinical trials and/or practice guidelines to guide choice of VTE prophylactic agent in obese, surgical patients. T/F

Pulmonary embolism does not contribute to a significant cause of mortality in hospitalized patients. T/F

BUILDING AND IMPLEMENTING A DATABASE FOR AMBULATORY PHARMACY INTERVENTION DOCUMENTATION

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Purpose: At Gundersen Lutheran clinical pharmacy services are provided in the following ambulatory clinics: oncology, cystic fibrosis, diabetes and heart failure. In addition services are provided in the clinic pharmacy (retail) and renal dialysis center. Currently there is no formalized system for monitoring or documenting interventions. By developing a universal database for documenting interventions electronically we will be able to analyze the information for cost savings and process improvement.

Methods: Identification of potential intervention categories for inclusion will be done by direct interviews of clinical pharmacy staff in the respective clinics, review of current non-formalized systems for documentation for each clinic (if available) and literature review. The literature review will be done using keyword searches in a Medline database including pharmacy interventions, ambulatory clinics, polypharmacy, cystic fibrosis and diabetes. Applicable intervention categories will be selected for inclusion into the database. The database will be developed to minimally include the following: associated drug, type of intervention, recommendation, outcome and pharmacist time spent on intervention. A flow chart will be developed to guide pharmacists in appropriate documentation. I will educate the pharmacy staff and assess the program as a whole for workability. The database will be built using CliniTrend.

Learning Objectives:

Common types of drug interventions being documented.

Average cost savings of drug interventions.

Self Assessment Questions:

What are some common types of interventions being documented?

What is one goal for intervention documentation to maximize compliance?

CLINICAL EFFICACY OF ERTAPENEM FOR TREATMENT OF ESBL-PRODUCING GRAM-NEGATIVE INFECTIONS

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Infections caused by extended-spectrum beta-lactamase (ESBL) producing organisms are becoming an increasing concern among practitioners. ESBLs are most commonly found in enterobacteracieae species such as Escherichia coli, Klebsiella pneumoniae, and Proteus mirabilis. Due to their ability to resist enzymatic degradation of the beta-lactam ring, carbapenems are the antibiotics of choice for these types of infections. There are three commercially available carbapenem antibiotics: meropenem, imipenem, and ertapenem. Ertapenem is the newest carbapenem and the first capable of being dosed once-daily. While several in vitro studies have demonstrated microbiological efficacy of ertapenem against ESBL-producing organisms, there is limited data on the clinical efficacy of ertapenem for this indication.

The objective of this study is to examine the clinical and microbiologic outcomes of ESBL-producing gram-negative infections treated with ertapenem compared to those treated with other antibiotics including other carbapenems and non-beta-lactams.

This is a retrospective, chart-review study to take place at Rush University Medical Center in Chicago, Illinois. Patients will be identified using microbiological reports and antibiotic usage reports for 2003-2005. Patients will then be divided into their respective cohort group based on the treatment received: ertapenem group, other carbapenem group, and other antibiotic group. Data to be collected for each patient includes risk factors for poor outcome, definition, treatment course, and microbiological and clinical outcomes. Microbiological outcome is documented as either success or failure. For those patients classified as a microbiological success, a time to first negative culture will also be documented. Clinical outcome will be documented as cure, improvement, failure, unable to determine, or death.

Results from data collection, as well as research conclusions drawn, will be presented at the Great Lakes Residency Conference.

Learning Objectives:

Describe the potential benefits of using ertapenem versus other carbapenems for treatment of ESBL-producing gram-negative infections.

Assess the clinical and microbiological efficacy of ertapenem for treatment of ESBL-producing gram-negative infections.

Self Assessment Questions:

T/F Ertapenem is the only carbapenem antibiotic capable of being dosed once daily. True False

ESBL infections are most commonly with which species of gram-negative bacteria?

ANTIBIOTIC ADMINISTRATION TIMING IN A SEPTIC POPULATION; AN INTERACTIVE PERSPECTIVE

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PURPOSE: As part of the Surviving Sepsis Campaign, it is suggested by guideline that timely, effective, and broad-spectrum antibiotic therapy be initiated as soon as possible after the diagnosis of sepsis is made and cultures have been drawn. To our knowledge, no study has been published which examines the interacting role of physician ordering, pharmacy data entry, and drug availability in the administration of antibiotics to the septic population. This study will examine various processes in the continuum of ordering to administration of antibiotics from a physician, nursing, and pharmacy prospective in a population of severe sepsis and septic shock patients.

METHODS: A retrospective chart review will be conducted on 100 patients (planned) at Northwest Community Hospital admitted with sepsis who are enrolled as part of the CHASE (Community Hospitals Against the Sepsis Epidemic) study. Data collected will include date and timing of first set of any culture(s), antibiotic orders, orders entered by pharmacy staff and delivery to nursing staff (either sent from pharmacy or available in Pyxis®), description of antibiotic change, location of first antibiotic dose(s) (e.g., ED, ICU, floor).

RESULTS: Based on preliminary data, patients who are admitted with the diagnosis of septic shock on nights and weekends have a delay in receiving appropriate antibiotic therapy based on records of appropriate initiation of therapy (e.g., written orders) and pharmacy preparation times. The effect this has on morbidity will be presented when all the data has been analyzed.

CONCLUSIONS: Data will suggest that programs may be implemented in various institution that could expedite antibiotic ordering, reviewing of cultures, and medication preparation times.

Learning Objectives:

Identify the roles early ordering of proper antibitoic therapy and reviewing of cultures have on the morbidity of patients admitted with septic shock.

Describe barriers to the proper administration of antibiotics in a septic population from a multidiscipline perspective.

Self Assessment Questions:

True or False: Patients who are admitted during nights and weekends with a diagnosis of septic shock commonly experience a delay in the administration of appropriate antibiotic therapy and an increase in morbidity.

Name three barries to the proper administration of antibiotics in a septic population.

ANALYSIS OF ANTIMICROBIAL USE IN A COMMUNITY TEACHING HOSPITAL

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Objective: The objective of this study is to assess the adjustment of antibiotic therapy after cultures and sensitivities (C&S) are available.

Methodology: This is a retrospective analysis of patients on a general medicine floor with pending and finalized C&S. Patients will be selected if they received an antibiotic that is on a predetermined list of drugs (i.e. frequently prescribed and broad-spectrum antibiotics). The following data will be collected from patient specific charts: patient information, reason for antibiotic therapy, prescriber discipline, C&S, initial antibiotic(s) prescribed, any change of antibiotic therapy, length of therapy, and time between availability of finalized C&S and revision of the antibiotic regimen. A recommended antibiotic treatment for the patient will be determined based on sensitivity results, the Sanford Guide to Antimicrobial Therapy 2005, and the IDSA guidelines utilizing patient specific data (i.e. infective organism, site of infection, allergies). If the initial antibiotic regimen was sufficient or it was appropriately adjusted according to the C&S, then the patient case will be classified as complete. If the antibiotic therapy was not optimized 24 hours after finalized C&S were made available, the cost of the remaining course of antibiotic treatment will be calculated and compared to that of the recommended antibiotic treatment. A change to the recommended antibiotic regimen will conclude the cost analysis for that patient case. Both timeliness of antibiotic optimization and the cost analysis will be used to assess the effectiveness of antibiotic adjustment after C&S are available.

Learning Objectives:

Identify how effectively antibiotics are prescribed within a community teaching hospital.

Assess areas of improvement for antibiotic prescribing within a community teaching hospital.

Self Assessment Questions:

What is the purpose of reviewing antibiotic utilization at St. Lukes Medical Center?

How effectively are antibiotics prescribed at St. Lukes Medical Center?

EVALUATION OF SEVERE SEPSIS RESUSCITATION AND MANAGEMENT IN THE MEDICAL INTENSIVE CARE UNIT

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Purpose: International practice parameters for the treatment of patients with severe sepsis were developed under the guidance of the Surviving Sepsis Campaign in 2003. Reducing the mortality rate from sepsis will require a systematic approach to therapy that ensures consistent application of evidence-based practices. Currently at Cleveland Clinic, the Medical Intensive Care Unit (MICU) does not have a treatment protocol for severe sepsis. We chose to determine if selected severe sepsis treatment practices in the MICU are consistent with resuscitation and management recommendations.

Methods: A retrospective review over 6 months was performed in concurrent adult patients admitted to the MICU with a diagnosis of severe sepsis. Patients not surviving at least 24 hours were excluded from this analysis. The following demographic data will be collected: gender, age, weight, comorbidities, APACHE II score, Sequential Organ Failure Assessment score at baseline and 24 hours, reason for admission to the MICU, primary diagnosis, and documented or presumed site of infection. Adherence to each of the resuscitation recommendations will be achieved if the task is completed within 6 hours of presentation. The resuscitation recommendations include: 1) serum lactate measurement; 2) blood cultures prior to antibiotic administration; 3) broad spectrum antibiotics administered within 1 hour; 4) a minimum of 20 mL/kg crystalloid/colloid equivalent is administered if hypotensive or elevated lactate; 5) administered vasopressors to maintain a mean arterial pressure >=60 mmHg if hypotension is not responsive to fluids; 6) achieved central venous pressure >=8 mmHg and central venous oxygen saturation >=70% if persistent hypotension or elevated lactate. Adherence to each severe sepsis management recommendation will be achieved if efforts are initiated to accomplish the following within 24 hours: 1) evaluation and/or treatment of relative adrenal insufficiency; 2) evaluation for and/or treatment with drotrecogin alfa; 3) intensive insulin therapy; 4) low tidal volume ventilation strategy.

Results: Data collection is ongoing and results are pending.

Learning Objectives:

Identify the initial six resuscitation recommendations for patients with severe sepsis.

Identify the four management recommendations for patients with severe sepsis.

Self Assessment Questions:

The goals of the Surviving Sepsis Campaign are to increase awareness and improve outcomes in patients with severe sepsis. T/F

Broad-spectrum antibiotics should be administered to patients with severe sepsis within one hour of non-emergency department admissions. T/F

CANDIDA SURVEILLANCE IN A COMMUNITY TEACHING HEALTH-CARE SYSTEM

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BACKGROUND: Nationally, the incidence of non-albicans Candida species is rising. Thus, when choosing empiric therapy for patients at high risk for fungal infections, it is important to know the predominant species within one's institution.

PURPOSE: The purpose of this study is to identify the predominant fungal species in hospitalized adult patients, compare species distribution between ICU and non-ICU patients, and evaluate temporal trends in fungal species.

METHODS: This retrospective study was conducted at two affiliated community teaching hospitals. A computer-generated list of positive fungal cultures for patients admitted between 2002 and 2005 was obtained from the microbiology department. Candida species included in the analysis were C. albicans, C. glabrata, C. krusei, C. parapsilosis, and C. tropicalis. Culture sites reviewed were blood, body fluids, and catheters. Cultures from urine and sputum were excluded, except for bronchoscopically-obtained samples.

RESULTS: A total of 711 isolates were analyzed for the preliminary analysis. The most common species was C. albicans, comprising 74.1% of the samples. This was followed by C. glabrata, 14.2%; C. parapsilosis, 7.0%; C. tropicalis, 5.9 %; and C. krusei, 1.3%. The incidence of non-albicans species of Candida was 27.4% in the ICU and 25.3% in the non-ICU patients (p=0.58). The incidence of non-albicans Candida was 24.7% in 2002; 24.2% in 2003; 27.4% in 2004; and 28.8% in 2005 (p=0.79).

CONCLUSIONS: Based on preliminary results, C. albicans remains the most common species of Candida in hospitalized patients. There is no difference in the incidence of non-albicans Candida species between ICU and non-ICU populations. The incidence of non-albicans Candida species has not increased over the past four years. Given these data, fluconazole should remain the empiric anti-fungal of choice.

Learning Objectives:

Identify Candida species as susceptible, susceptible dose-dependent, or resistant to fluconazole.

Describe the importance of knowing local fungal epidemiology and how this may affect antifungal prescribing.

Self Assessment Questions:

The Candida species that is generally considered susceptible dose-dependent to fluconazole is:
A.) Candida albicans
B.) Candida glabrata
C.) Candida krusei
D.) Candida parapsilosis

Approximately 90% of patients with candidemia will have at least one positive blood culture. True or False

EVALUATION OF THE "1500 RULE" AND "1800 RULE" FOR ESTIMATING SUPPLEMENTAL INSULIN DOSES IN HOSPITALIZED PATIENTS

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Purpose: Supplemental insulin is frequently utilized in hospitalized patients either alone or with scheduled insulin. The 1500 rule for regular and 1800 rule for rapid-acting insulin are proposed to estimate supplemental doses, however these rules lack systematic validation. Our purpose was to evaluate the success rate of the prediction rules in hospitalized diabetics.

Methods: A retrospective chart review was conducted including diabetic patients admitted to a medical or surgical service and on home insulin. Patients with a hospital stay greater than 13 or 16 days on a medical or surgical service, respectively, were excluded. Inclusion criteria for supplemental doses were an initial blood glucose (BG) drawn greater than 4 hours after a meal, supplemental insulin dose administered less than 1 hour after initial BG, and repeat BG drawn between 5-8 hours after regular insulin or 3-6 hours after rapid-acting insulin. Supplemental insulin doses were excluded if the initial BG was drawn less than 5 hours after regular or 3 hours after rapid-acting insulin. Supplemental insulin doses were also excluded if any nutrition, regular insulin, or rapid-acting insulin was administered before the repeat BG. The primary outcome was the success rate of the rules, defined as less than a 30 mg/dL difference between actual and predicted change in blood glucose after a supplemental dose. Secondary outcomes included the calculated difference between the actual and predicted change in blood glucose and success of the prediction rules in predetermined subgroups. If the primary analysis determines that the rules are a failure, regression analysis will be performed to determine another rule more predictive for estimating supplemental insulin doses.

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

Learning Objectives:

To understand how the 1500 rule and 1800 rule are used as a clinical guide to estimate supplemental insulin doses.

To discuss the predictive value of the rules for estimating supplemental insulin in hospitalized patients described in the study.

Self Assessment Questions:

The 1500 rule has been systematically validated in randomized, controlled clinical trials. T or F

Using the 1500 rule to estimate a supplemental insulin dose, how many units of regular insulin would be predicted to reduce blood glucose by 90 mg/dL in a patient receiving 50 units of daily insulin at home?

GASTRIC ACID SUPPRESSION BY PROTON PUMP INHIBITORS AS AN INDEPENDENT RISK FACTOR FOR THE DEVELOPMENT OF CLOSTRIDIUM DIFFICILE ASSOCIATED DIARRHEA

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Purpose:
To determine if there is an association between the use of proton pump inhibitors and the development of Clostridium difficile associated diarrhea (CDAD).

Methods:
This is a retrospective case-control study. A database search of patients admitted to St. Rita's Medical Center was performed by the Microbiology Department that selected subjects who had been tested for C. difficile toxin A from January 1, 2005 to October 31, 2005. From this population, subjects who were identified as C. difficile positive were matched to control subjects who were C. difficile negative. Other characteristics to which subjects were matched include: age (within 5 years), sex, chronic dialysis, acute dialysis, H2 antagonists use, total parenteral nutrition use.
Subjects were included in the study if they had diarrhea resulting in C. difficile toxin assay testing and were at least 18 years old. Subjects were considered exposed to a proton pump inhibitor (PPI) if they met one of the following conditions: PPI at least three days prior to development of diarrhea, PPI prior to admission to hospital, PPI seven consecutive days within the preceding month. Subjects were excluded from the study if they had a positive diagnosis of CDAD within the previous six months or did not match according to criteria.

Results:
57 case subjects were successfully matched to control subjects. 63 percent (36/57) of the case subjects met criteria for exposure to PPI compared to 65 percent (37/57) of the controls.

Conclusions:
Based on these preliminary results, there appears to be insufficient evidence to conclude that PPI exposure increases the risk of CDAD. Further data analysis will be presented at the Annual Great Lakes Residency Conference.

Learning Objectives:

To describe PPI characteristics and their potential impact on the development of CDAD.

To determine if PPI exposure increases the risk for developing CDAD.

Self Assessment Questions:

T/F: A vegetative inoculum of C. difficile is easily destroyed by stomach acid.

T/F: C. difficile is transmitted through the oral-fecal route.

EVALUATION OF A PROTOCOL FOR THE DIAGNOSIS AND MANAGEMENT OF PNEUMONIA IN A MEDICAL INTENSIVE CARE UNIT

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Pneumonia is a common and deadly complication. Accurate diagnosis and prompt antimicrobial therapy are central to the management of pneumonia. Previous local data have identified inconsistencies in these areas. To improve rates of adequate empiric antimicrobial therapy and facilitate more uniform diagnostic strategies, multidisciplinary protocols for the diagnosis and management of hospital acquired pneumonia (HAP), ventilator-associated pneumonia (VAP), and community-acquired pneumonia (CAP) have been designed and implemented in the local Medical Intensive Care Unit (MICU).

This study is being conducted in the MICU at The University Hospital, a 500-bed academic medical center in Cincinnati, Ohio. Following implementation of the protocols, all patients ^{3} 18 years of age admitted to the MICU with pneumonia will be eligible for inclusion. Patients will be excluded if they (a) were initially treated with antibiotics in a nursing unit other than the MICU, (b) have a diagnosis of cystic fibrosis, or (c) have human immunodeficiency virus. The primary outcomes for HAP and VAP will be (1) frequency of adequate empiric antimicrobial therapy, defined as having at least one empiric antibiotic with in vitro activity against the pneumonia pathogen and (2) rate of appropriate empiric antimicrobial therapy, defined as antibiotic selection adhering to the specific protocol. For patients with CAP, the primary outcome will be the rate of adherence to guideline and JACHO core measure recommendations, as specified in the CAP order set. Secondary outcomes for all patients and pneumonia episodes include: duration of antimicrobial therapy for pneumonia, total days of antibiotic therapy in the ICU, hospital and ICU lengths of stay, ventilator days, time to clinical resolution, pulmonary infection recurrence rate and in-hospital mortality. Primary and secondary outcomes will be compared to a pre-protocol implementation cohort already evaluated in the MICU. The University of Cincinnati Institutional Review Board will review the study protocol.

Results are pending.

Learning Objectives:

Evaluate the use of new protocols for the treatment and diagnosis of VAP.

Discuss appropriate empiric antimicrobial therapy and length of antimicrobial therapy in the treatment of pneumonia.

Self Assessment Questions:

American Thoracic Society guidelines for CAP suggest patients be admitted to the ICU if any of the major criteria are met (mechanical ventilation, septic shock) or two of the minor criteria are met (systolic blood pressure < 90mmHG, multilobar disease or Pao2/Fio2 ratio <250). T or F

The diagnosis of HAP/VAP should be suspected if the patient has a new or progressive radiographic infiltrate along with clinical findings suggestive of infection. T or F

VENTILATOR ASSOCIATED PNEUMONIA AND THE USE OF ACID SUPPRESSIVE THERAPY IN THE NEONATAL INTENSIVE CARE UNIT AT CINCINNATI CHILDREN'S HOSPITAL MEDICAL CENTER

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Background:
Use of acid suppressive therapy, consisting of proton pump inhibitors and histamine2 receptor antagonists, is becoming common practice in the Regional Center for Neonatal Intensive Care (RCNIC) at CCHMC. In adults, studies have found that gastric contents reaching a pH greater than four have the potential for colonization with bacteria. It has been theorized that bacterial colonization of the stomach may contribute to the pathogenesis of ventilator associated pneumonia (VAP). Although numerous randomized clinical trials have provided controversial results regarding the association of specific stress ulcer prophylaxis agents and the increased risk of VAP, none of these trials included NICU patients.

Purpose:
To evaluate the association of ventilator associated pneumonia in the RCNIC with the use of histamine2 receptor antagonists and proton pump inhibitors.

Methods:
A retrospective chart review is underway. Inclusion criteria included admission to the RCNIC from 1/01/2000 to 7/1/05, mechanical ventilation via an endotracheal tube and diagnosis of pneumonia after 48 hours of mechanical ventilation. Data being collected includes patient demographics, use of acid suppressive therapy (indication, dose, frequency, and duration), respiratory microbial culture results, length of time maintained on a mechanical ventilator before and after the diagnosis of pneumonia and the length of time until the resolution of pneumonia.

Results/Conclusions:
Preliminary review of 296 patient charts has identified 25 patients who developed VAP in the RCNIC. Of these 25 patients, 17 charts have been assessed for the use of acid suppressive therapy before the development of VAP. It has been determined that 11 (44%) patients received ranitidine, 1 (4%) patient received pantroprazole and 5 (20%) patients did not receive acid suppressive therapy before the development of VAP. Data collection and further analysis is continuing and will be presented at the conference.

Learning Objectives:

Identify the modifiable and nonmodifiable risk factors for developing VAP in adult patients.

Describe the proposed mechanism for the increased risk of VAP associated with concurrent acid suppressive therapy.

Self Assessment Questions:

T/F Numerous randomized clinical trials, using various agents and doses with various study populations, have provided concrete evidence that there is an association of acid suppressive therapy with an increased risk of VAP.

T/F Neonatal risk factors have been identified that may be modified to decrease the incidence of VAP.

EVALUATION OF FONDAPARINUX AND ENOXAPARIN USE IN A CANCER CENTER

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Background:
Cancer patients are at high risk of developing an induced hypercoagulable state. In addition to this hypercoagulable state, other predisposing conditions such as immobility, surgery, the use of central lines and antineoplastic agents leads to an increased risk of venous thromboembolism. However, cancer patients also may present with an induced state of thrombocytopenia due to chemotherapy and/or underlying disease. This may pose a challenge for anticoagulation therapy due to an increased risk of bleeding.

Fondaparinux and enoxaparin are both approved in the treatment of deep venous thrombosis and pulmonary embolism as well as in thrombosis prophylaxis in a post-surgery setting. Fondaparinux is a factor Xa inhibitor with no effects on platelets or thrombin. There have been no reported cases of heparin-induced thrombocytopenia with fondaparinux so this agent may be beneficial in cancer patients.

The purpose of this study is to investigate and compare the safety outcomes and cost-effectiveness of the use of these agents in cancer patients.

Methods:
In this retrospective review the following data will be collected: indication of using enoxaparin or fondaparinux, reported bleeding complications (either major or minor), platelet counts, reported episodes of heparin induced thrombocytopenia and heparin induced thrombotic thrombocytopenia, length of stay, total cost of therapy with either fondaparinux or enoxaparin, and other complications that could be attributed to fondaparinux or enoxaparin use. All patients with a diagnosis of cancer that were treated with either fondaparinux or enoxaparin from May 2005 to present will be included in this study.

Results/Conclusions:
The results and conclusions of this study will be presented at the Great Lakes Residency Conference.

Learning Objectives:

To identify risk factors in cancer patients for the development of thrombosis

To describe the pharmacodynamic and pharmacokinetic differences between enoxaparin and fondaparinux

Self Assessment Questions:

What are some predisposing conditions for venous thromboembolism in the cancer patient population? (List at least three).

What are the main pharmacodynamic differences between fondaparinux and enoxaparin?

INCIDENCE OF COMMUNITY-ASSOCIATED, METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS IN THE EMERGENCY DEPARTMENT POPULATION

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Background and purpose:
Methicillin-resistant Staphylococcus aureus (MRSA) has been traditionally associated with nosocomial infections. However, MRSA in the community has been increasingly observed in the recent years. Particularly an increase in community-associated MRSA (CA-MRSA) skin and soft tissue infections (SSTIs) in the Chicago metropolitan area, and throughout the country has been reported in the literature. Despite recommendations for empiric treatment of SSTIs, it is unknown whether prescribing patterns for empiric treatment of skin and soft tissue infections at the University of Illinois Medical Center at Chicago (UIMCC) emergency department (ED) target CA-MRSA, or what the incidence of this pathogen in SSTIs in this emergency care facility is. The purpose of this study is to determine the incidence of CA-MRSA SSTIs in the ED patient population at UIMCC, to evaluate susceptibility patterns of the organisms isolated from these infections, and current treatment practice in our ED. With this information the investigators hope to set the stage for the development of guidelines for the treatment of CA-MRSA SSTIs in UIMCC's ED patient population.

Methods:
A retrospective chart review will look at skin and soft tissue infections in the ED population from January 1st, 2003 to December 31st, 2004, which is roughly estimated to include 180 cases of SSTIs. The ED culture logbook will be used to identify subjects with SSTIs. Data collected will include population characteristics, organism identification and susceptibility pattern, organism genotype, D-test results, MRSA risk factors, site of culture, empiric and culture guided treatment, and treatment outcomes. Additionally, a list ICD-9 codes of SSTIs will be generated for comparing the number of cultured wounds to the total number of SSTIs. Results will be analyzed and presented at the Great Lakes Residency Conference.

Learning Objectives:

Compare and contrast community-acquired and hospital-associated MRSA (HA-MRSA).

List recommended empiric treatment options for CA-MRSA SSTIs.

Self Assessment Questions:

CA-MRSA and HA-MRSA are always susceptible to beta lactam antibiotic therapy. T or F

The use of oral clindamycin or trimethoprim-sulfamethoxazole is reasonable for the treatment of CA-MRSA skin or soft tissue infections. T or F

EVALUATION OF A PHARMACY DRIVEN PNEUMOCOCCAL AND INFLUENZA VACCINATION PROGRAM FOR PATIENTS WITH PNEUMONIA

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Introduction/Background:
Pneumococcal pneumonia and influenza are vaccine-preventable illnesses responsible for a substantial burden on the United States health-care system. Together, they are estimated to be responsible for more than 400,000 hospitalizations and more than 40,000 deaths each year. Due to the significant burden these illnesses have on the United States healthcare system, increasing immunization rates has become a priority of many national healthcare organizations and initiatives.
One method shown to be successful in increasing vaccine screening and administration rates is the implementation of an inpatient pharmacy-driven vaccination program. This study retrospectively investigates the effect of one such program in a targeted group of patients diagnosed with pneumonia.

Objectives:
The objectives of this retrospective study include determining the effect of a pharmacy driven pneumococcal and influenza immunization program on vaccine screening and administration rates in patients diagnosed with pneumonia.

Methods:
These objectives will be investigated by reviewing the computerized medical record for patients who received a diagnosis of pneumonia, recording the number of these patients who were screened for pneumococcal and influenza vaccination, and the number of patients who were subsequently administered these vaccines.

Results/conclusions: To be presented at the conference.

Learning Objectives:

To understand the burden of pneumococcal and influenza related illness in terms of morbidity and mortality.

To determine the effect of a pharmacy driven pneumoccocal and influenza immunization program on immunization rates in patients diagnosed with pneumonia.

Self Assessment Questions:

The Center for Disease Control and Prevention endorses a standing order immunization protocol as a way to increase vaccination rates. T/F

The pharmacy driven pneumococcal and influenza immunization program described in this study resulted in increased immunization rates of patients diagnosed with pneumonia when compared to historical rates at the same institution. T/F

STABILITY OF SODIUM PHENYLBUTYRATE IN TWO ORAL LIQUID VEHICLES

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Objective: Sodium phenylbutyrate is a therapy used to treatment urea cycle disorders (UCDs). Currently, no oral liquid formulation is commercially available. The objectives of this study are to prepare sugar-containing and sugar-free sodium phenylbutyrate suspensions and determine the stability of the formulations over a 90-day period.

Methodology: Sodium phenylbutyrate suspensions (200 mg/mL) were prepared using sodium phenylbutyrate powder USP, Ora-Plus and either Ora-Sweet or Ora-Sweet SF. Three 60-mL samples of both the sugar-containing and sugar-free suspensions were made and stored at room temperature. 500-mcL samples were withdrawn from each bottle immediately after preparation and at 7, 14, 30, 60 and 90 days and diluted to an expected concentration of 100 mcg/mL with mobile phase. The stability-indicating, high-performance liquid chromatography (HPLC) assay was a reverse-phase partition chromatography consisting of the following: C18 column, mobile phase (40% acetonitrile and deionized-distilled water) pumped at a flow rate of 1 mL/min. with the detector set at a wavelength of 218 nm.

Results: The percentage of the initial concentration remaining of the phenylbutyrate sugar-containing suspension was 98.70 ± 0.94 on day 7, 99.52 ± 1.03 on day 15, 99.47 ± 0.79 on day 28, 99.71 ± 0.99 on day 60 and 97.17 ± 2.00 on day 90. The percentage of the initial concentration of the phenylbutyrate sugar-free suspension was 95.44 ± 2.50 on day 7, 98.28 on day 14, 98.06 ± 1.06 on day 28, 99.70 ± 0.80 on day 60 and 97.44 ± 1.34 on day 90.

Conclusions: Suspensions of sodium phenylbutyrate, 200 mg/mL, prepared with Ora-Plus and either Ora-Sweet or Ora-Sweet SF were stable at room temperature for at least 90 days. The taste of both preparations had an initial bitter taste with a strong bitter aftertaste; the sugar-containing suspension was most palatable.

Learning Objectives:

List the steps for preparation of sodium phenylbutyrate suspension.

Describe the methodology for evaluating the stability of an extemporaneous oral liquid preparation.

Self Assessment Questions:

Describe the correct methodology for evaluating the stability of an extemporaneously prepared oral liquid preparation?

What is the stability of compounded sodium phenylbutyrate suspensions?

LOW DOSE PROMETHAZINE IN THE ELDERLY

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Purpose: Elderly patients, defined as those over 65 years, are dramatically increasing in the United States, yet there are limited clinical trials in this population. Geriatrics are more likely to experience adverse drug reactions due to pharmacokinetic and dynamic changes. Promethazine is a cost effective antiemetic and useful in multimodal approaches targeting different receptors. However, promethazine is considered a high-risk drug in the elderly according to the Beers criteria due to the potential for anticholinergic sides effects especially at higher doses. A recent study in middle-aged patients reported that doses of promethazine 6.25, 12.5 and 25mg were equally effective in the treatment of post-operative nausea. This study evaluates the safety and efficacy of promethazine in the elderly population at doses ranging from 6.25 to 25mg, with the hypothesis that lower doses may be more tolerable.
Methods: This retrospective and concurrent study examines three doses of IV/IM promethazine administered for treatment of N/V in patients > 65 years old who are admitted to the adult medical unit. Education of all medical staff was done promoting usage of low dose promethazine. A daily pharmacy-generated list of elderly patients with promethazine ordered is utilized. Data is reviewed from medical charts including patient's weight, race, gender, diagnosis, dose and frequency of administration. Nursing staff are also involved and asked to document specific data observed at time of promethazine administration including if the patient experienced relief of N/V, the time to relief and what ADRs occurred onto a nursing documentation sheet. Unit clerks or the investigator places documentation sheets into the patient's kardex when promethazine is ordered. Targeted ADRs include blurred vision, confusion, drowsiness, dry mouth, excitation, hysteria, nervousness, phlebitis, or rash. The primary outcomes are the degree of efficacy and incidence of adverse effects occurring with each dose.
Conclusions: To be presented at GLRC.

Learning Objectives:

Understand the role and appropriate dose of promethazine in elderly patients who experience nausea or vomiting

Determine the safety and efficacy outcomes of three different intravenous doses of promethazine in general medical elderly patients

Self Assessment Questions:

T or F Promethazine is listed on the Beer's Criteria as a potentially inappropriate medication

T or F Geriatric patients are NOT at an increased risk for adverse drug reactions or ADR-related complications.

SYMPTOM NON-DISCLOSURE SECONDARY TO SELF-TREATMENT WITH HERBAL PRODUCTS

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Purpose: To (1) identify self-treated symptoms with herbal products, (2) identify reasons for non-disclosure to the provider, and (3) determine changes needed within the health clinics to avoid potential adverse consequences secondary to undisclosed herbal use.
Methods: A questionnaire will be used to identify symptoms that are self-treated with herbal products, source of recommendation, form and sources of herbal products, disclosure to health care providers, and frequency of follow-up with provider for similar symptoms treated with herbals. The study will be conducted at five clinics located in Columbus, Ohio serving a primarily indigent population. Subjects 18 years and older waiting to see a health care provider at any of the clinics during study days will be asked to participate. Investigators and trained pharmacy students will administer the questionnaire during a patient interview. Fluent bilingual interviewers will collect information from non-English speakers. More than one family member will be allowed to participate in the study. A minimum of 200 interviews will be completed. Data will be entered into a SPSS database
Results: Data collection in progress. Preliminary results will be presented.
Conclusion: This study will provide baseline information regarding symptoms treated with herbal products and provider non-disclosure. The collected data may be used for developing future research projects on herbal use and implementation of health services and procedure changes within the health system to avoid adverse consequences such as herbals masking symptoms of a more serious health condition. This study will also provide data to identify symptoms attributed to different areas of interest identified by the National Center of Complementary and Alternative Medicines (NCCAM), such as insomnia, depression, or irritable bowel syndrome, allowing opportunities for future research projects.

Learning Objectives:

To identify commonly used herbal products and reasons for their use by a primarily indigent population.

To recognize reasons for non-disclosure of herbal products to health care providers.

Self Assessment Questions:

What are some of the common herbal or natural products used in an indigent population?

True or False: The main reason for herbal use non-disclosure to health care providers is, “never been asked.”

A RETROSPECTIVE REVIEW OF THE USE OF A CALCINEURIN SPARING PROTOCOL IN HISPANIC KIDNEY TRANSPLANT RECIPIENTS UNDER THYMOGLOBULIN INDUCTION VS HISTORICAL CONTROL OF PATIENTS RECEIVING CALCINEURINS

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Calcineurin inhibitor drugs (CNI) have been routinely used for immunosuppression in renal transplantation since the 1980s. Although CNIs have been associated with improved short-term outcomes with decreased rates of acute rejection, they are nephrotoxic and can cause chronic allograft nephropathy (CAN). With the development of sirolimus, newer immunosuppressive regimens are being evaluated to spare the use of CNIs and their associated nephrotoxicity. Multiple studies have evaluated CNI-free immunosuppression protocols and have found that CNI-free regimens using sirolimus had similar efficacy in preventing acute rejection when compared to CNI- based immunosuppressive regimens and were associated with less nephrotoxicity. OBJECTIVE: To retrospectively review rejection rates, and adverse effects in Hispanic renal transplant patients who received a calcineurin inhibitor sparing immunosuppression protocol vs. a historical control of Hispanic patients receiving calcineurin inhibitors STUDY DESIGN: Retrospective chart review of existing medical records comparing rejection rates and adverse effects among Hispanic kidney transplant recipients receiving a CNI-free regimen with sirolimus vs a historical CNI regimen.
METHODS: We will retrospectively review UIMCC transplant clinic charts to identify Hispanic patients who followed a protocol consisting of thymoglobulin induction with a CNI-free immunosuppressive regimen containing sirolimus between the dates of January 1, 2005 to July 31, 2005. These patients will be compared to a matched cohort of Hispanic patients who followed a historical protocol consisting of interleukin-2 receptor antagonist induction with a CNI containing immunosuppressive regimen. The patients receiving a CNI containing immunosuppressive regimen will also be identified using a retrospective review of UIMCC transplant clinic charts.

Learning Objectives:

Compare and contrast calcineurin inhibitor drugs to sirolimus

Evaluate the difference between thymoglobulin and the interleukin-2 receptor antagonists when used as induction agents in renal transplantation

Self Assessment Questions:

True or False: Sirolimus pharmacological action is via acting on calcineurin?

True or False: Impaired wound healing and mouth ulcers are both side effects which may be associated with use of sirolimus?

ASSESSING COSTS AND EFFECTIVENESS OF LONG-ACTING RISPERIDONE INJECTION IN SCHIZOPHRENIC PATIENTS AT A VETERANS AFFAIRS HOSPITAL

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Background: Over 282,000 veterans have been diagnosed with schizophrenia, a brain disorder that impairs a person's ability to think clearly and disturbs emotions and behavior. Costs associated with treatment of schizophrenia are significant, in part due to the tendency of patient noncompliance. A new alternative in the treatment of schizophrenia and other psychoses are long-acting depot formulations of atypical antipsychotics. Long-acting risperidone is the first such atypical antipsychotic to provide a therapeutic option for the treatment of schizophrenia.

Objective: The primary objective of this study is to describe the clinical and economic outcomes of long-acting risperidone in veteran patients. As a secondary objective, the repercussions of disease relapse associated with patient noncompliance will be analyzed.

Methods: The study is a retrospective chart review of schizophrenic patients currently on long-acting risperidone injection. The Computerized Patient Record System (CPRS) was used to select patients who have been on risperidone injectable. Data were analyzed from six months immediately prior to and six months after the start of risperidone injectable in order to determine if long-acting risperidone injection is more effective than previous therapy. Patients were included in the analysis if they were at least 18 years of age, had a diagnosis of schizophrenia, were on risperidone injectable for at least six months, and were a Zablocki VAMC patient. A data-collection sheet was created with the following information: patient age, gender, previous psychiatric treatment, treatment doses/dosage forms, monitoring parameters, and refill information. The number of inpatient hospitalizations and outpatient costs six months before and six months after risperidone injectable use were also included in the study.

Results: Fifty patients who have been on long-acting risperidone injection were reviewed. Seventeen met the inclusion criteria. Data collection is in process. Results and conclusions of the study will be presented at the conference.

Learning Objectives:

Describe the efficacy of risperidone injectable for treatment of schizophrenia in the setting of a VA regional medical center.

Describe the repercussions of disease relapse associated with patient noncompliance.

Self Assessment Questions:

Risperidone injectable is as effective as oral or other injectable antipsychotics for treatment of schizophrenia. T/F

Patient compliance plays an important role in achieving disease remission. T/F

IMPACT OF MULTIDISCIPLINARY TELEPHONE-BASED DISEASE STATE MANAGEMENT INTERVENTIONS IN PATIENTS WITH HEART FAILURE

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Purpose: To determine if a multidisciplinary telephone-based disease state management program would improve the clinical and economic outcomes associated with the management of heart failure.

Methods: A one-year retrospective review of commercial and Medicaid managed care claims data was completed for members identified by ICD-9 codes 428.x and 425.x during 2004. Data collection included heart failure-related hospitalizations, emergency department visits, physician visits, medication use, and cost. Following baseline analysis, patients were enrolled into a six month telephone-based disease state management program operated by a nurse and a pharmacist. Depending on the severity of the patient's disease, the nurse contacted the patient between every 4 days and every 60 days to assess the patient's current health status and to provide counseling where appropriate. Pharmacist assessment of medication regimens and communication with physicians was used to optimize therapeutic approaches.

Results: Pre-enrollment analysis of 112 patients (mean age 55.5 +/- 10.6 y) revealed a 50 percent hospitalization rate, 27 emergency department visits, and 599 physician visits in the preceding year. Seventy-three patients (65.2%) were being treated with an angiotensin converting enzyme inhibitor with 29 (39.7%) of those patients not at the target dose. Seventy-six patients (67.9%) were receiving beta-blockers with 65 patients (85.5%) not at the target dose. Following implementation of the disease management program, it is anticipated that a decrease in hospitalizations and emergency department visits along with an increase in utilization of optimal dose angiotensin converting enzyme inhibitors and beta-blockers will be seen at the three month and six month evaluation periods compared to baseline.

Conclusion: The implementation of a six month telephone-based heart failure disease management program utilizing a combination of nurse and pharmacist interventions is expected to improve the clinical management of heart failure while reducing overall healthcare costs.

Learning Objectives:

Describe the rational for a nurse and pharmacist-operated disease state management intervention in a managed care organization.

Outline the process necessary to implement a similar heart failure management program in comparable clinical settings.

Self Assessment Questions:

True or False: A pharmacist and nurse-operated disease state management program of heart failure patients lead to an increase in the number of patients receiving optimal doses of their angiotensin converting enzyme inhibitors and beta-blockers.

True or False: A pharmacist and nurse operated disease state management program of heart failure patients lead to a decrease in the number of hospitalizations and emergency room visits due to heart failure.

ACQUISITION AND INTEGRATION OF PHYSICIAN-OWNED RETAIL PHARMACIES BY A UNIVERSITY HOSPITAL SYSTEM: A GUIDE TO FACILITATING HEALTHCARE MERGERS.

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The University of Wisconsin Hospital and Clinics (UWHC), the University of Wisconsin Medical Foundation (UWMF) and the University of Wisconsin Medical School (UWMS) collaboratively form the entity UW Health, providing comprehensive academic-based healthcare throughout Wisconsin. Of the thirteen UW Health Pharmacies in Madison, UWHC owns and operates eight ambulatory/retail pharmacies while UWMF owns and operates five retail pharmacies. The pharmacies share the UW Health name but the employees, operations and overall systems are not integrated. In an effort maximize the continuity of care for patients and economies of scale across UW Health, plans have been made to integrate several patient care service lines and departments across the three organizations.

In an effort to maximize consistency of patient medication care service, efficiency and profitability across the ambulatory pharmacy care system, it was agreed that UWHC would acquire the five UWMF pharmacies. Per the agreement, the UWHC Pharmacy Department would assume ownership and operations of the UWMF pharmacies. Methods include developing a financial proforma to gain administrative support for the pharmacy integration, developing a legal purchasing agreement between the entities, and integration of all aspects of pharmacy operations including pharmaceutical wholesaler services, transitioning employees and determining salaries and benefits, prescription delivery services, information systems, licensure, financial management systems, marketing services and patient care services. Outcomes for measuring the success of the integration include financial performance, customer retention as well as pharmacy staff and integration team perception of the integration.

This presentation will provide a detailed action plan for integrating separate pharmacy organizations into one comprehensive pharmacy network. Resources and collaborative efforts required are from several departments to ensure a successful integration. Actions necessary to ensure the comfort of key stakeholders, steps taken to create a positive working relationship and environment, methods and preliminary results will be presented.

Learning Objectives:

Develop and implement a project plan to integrate the 5 physician owned retail pharmacies into a network of 8 existing ambulatory/retail pharmacies.

Identify the internal and external resources that are necessary to facilitate the pharmacy integration.

Self Assessment Questions:

Which of the following were considered to be driving factors in moving forward and acquiring and integrating the 5 physician-owned retail pharmacies into the hospital's current network of pharmacies?

a. Maximize continuity of care of patients in the Madison-area
b. Provide a guide for when other service lines integrate across the two organizations
c. Reduce operational redundancies and maximize purchasing power
d. All of the above

True or False: A return-on-investment analysis and projected revenue forecast were utilized in garnering administrative support.

A PILOT STUDY TO EXAMINE VORICONAZOLE TROUGH CONCENTRATIONS IN FEBRILE NEUTROPENIC PATIENTS

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Background
Voriconazole is a broad-spectrum azole antifungal indicated for invasive yeast and mould infections. Voriconazole exhibits large interpatient variability in pharmacokinetics secondary to saturable drug metabolism, polymorphisms in drug metabolizing isoenzyme, and concomitant administration of CYP450 inhibitors or inducers. In addition, factors such as age, weight, and gender may also contribute to the pharmacokinetic variability. In vitro, animal and clinical studies have indicated systemic voriconazole concentrations may be associated with efficacy and toxicity. Efficacy has been associated with free drug 24-hour AUC to MIC ratio of 24. Elevated systemic voriconazole levels have been linked to elevations in liver function tests (LFTs) and other hepatic injuries, some resulting in death. Because of these reasons, monitoring voriconazole concentrations during therapy to avoid treatment failure or development of toxicity may be warranted. In order to determine the usefulness of voriconazole therapeutic drug monitoring, we are conducting a pilot study to examine voriconazole trough concentrations in a small and homogenous patient population.

Objective
To examine voriconazole trough concentrations in patients with neutropenic fever at Cleveland Clinic.

Methods
After receiving the appropriate oral loading and maintenance doses for 10 to 15 doses, a single blood sample within 30 minutes of the next voriconazole dose will be obtained from 25 patients with neutropenic fever. The blood samples will be analyzed for voriconazole concentrations using a validated HPLC assay. The trough concentrations from the current study will be compared to those published in the literature. In addition, assessment will be made to determine whether a relationship exists between voriconazole trough concentration, baseline LFTs and weight normalized dosage. Finally, voriconazole trough concentrations between patients who did and did not receive concomitant CYP450 inducers or inhibitors will be compared.

Results
The study is in progress. Results and conclusions will be presented at the conference.

Learning Objectives:

Review the pharmacokinetic profile of voriconazole.

Discuss the rationale for obtaining voriconazole trough concentration.

Self Assessment Questions:

Voriconazole exhibit interpatient variability with respect to drug metabolism. (True or False)

Voriconazole does not cause abnormalities in liver function tests. (True or False)

COMMUNITY PHARMACY RESIDENTS' PURSUIT OF ACADEMIC POSITIONS: ASSESSMENT OF KEY FACTORS INFLUENCING CAREER PATHS

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Purpose: To 1) determine the percentage of residents accepting faculty positions after APhA Community Pharmacy Residency Program (CPRP) completion, 2) identify factors influencing a CPRP resident's decision to pursue a career in academia, and 3) compare perceived characteristics of ideal position versus characteristics of position accepted.
Methods: CPRP residency directors and preceptors were contacted to compile a current roster of residents. Pre- and post-surveys were developed then field-tested on pharmacy residents at The Ohio State University Medical Center. The final online survey was sent via email to all CPRP residents in October 2005 (pre-survey) and the post-survey will follow in June 2006. Surveys detail resident demographics, program characteristics, and resident experience with clinical practice, teaching, and research. The pre-survey also requests information on job preferences; while the post-survey focuses on job selection.
Results: Fifty-three CPRP residents were identified, 85% (n=45) completed the pre- survey. One hundred percent of respondents anticipated teaching experience through precepting, lecturing, and/or facilitating workshops, recitations, or labs. The top three job preferences included community pharmacy, faculty, and ambulatory clinic. Thirty-six percent indicated they were seriously considering faculty positions. Ideal job characteristics most important to respondents included flexibility, collaboration with other healthcare professionals, and a variety of daily activities. Analysis of the post-survey will provide percentage accepting faculty positions, evaluate factors influencing decisions to pursue academic careers, and compare characteristics of the ideal job versus accepted position.
Conclusions: Pharmacy faculty shortages are well documented in recent literature. According to AACP committee reports, pharmacy residents and fellows are key candidates to train and fill these faculty positions. Study results are expected to show residency preceptors and potential residents how CPRP experience and training relates to the pursuit of academic careers. It will also provide valuable information to colleges of pharmacy to assist in the recruitment of new faculty.

Learning Objectives:

Discuss the ongoing pharmacy faculty shortage and the recommendations made by the American Association of Colleges of Pharmacy (AACP).

Describe CPRP residents anticipated teaching experiences during their residency as they relate to job preferences and ideal job characteristics.

Self Assessment Questions:

TRUE or FALSE: The 2002 AACP Task Force on the Role of Colleges and Schools in Residency Training recommend that post graduate training be a requirement to obtain a faculty position.

TRUE or FALSE: The majority of community pharmacy residency programs offer a teaching certificate program.

EFFECTS ON THE SCREENING AND MONITORING OF METABOLIC COMPLICATIONS FROM ATYPICAL ANTI-PSYCHOTICS AFTER IMPLEMENTATION OF AN ORDERING TEMPLATE

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Purpose: To determine if a new ordering template for atypical anti-psychotics increases the number of patients who receive appropriate baseline and 12 week follow-up monitoring for metabolic side effects.

Background: Atypical anti-psychotics have provided progress in the treatment of psychiatric diseases, however along with these medications have come side effects including elevated cholesterol, diabetes, and weight gain. Atypical anti-psychotics include: clozapine, risperidone, quetiapine, olanzapine, aripiprazole, and ziprasidone. Correct screening and monitoring of these side effects is important so providers can decide whether benefits outweigh risks. The American Diabetes Association, American Psychiatric Association, American Association of Clinical Endocrinologists, and North American Association for the Study of Obesity convened in late 2003 to develop a consensus on the prevalence and need for monitoring metabolic effects of atypical anti-psychotics. Recommendations included the need for monitoring blood pressure, BMI, fasting plasma glucose, and fasting lipid profile at baseline and 12 weeks after initiation of atypical anti-psychotics.

Methods: An ordering template was implemented in December 2005 for atypical anti-psychotics at the William S. Middleton VA. This template prompted providers of the guidelines for monitoring upon initiation of the medication and allowed them to order appropriate labs directly from the template. The template also allowed providers to view patient's latest labs. These labs included: fasting lipid profile, fasting glucose, and BMI. A computerized search identified patients who had received atypical anti-psychotics prior to template initiation and patients who began atypical anti-psychotics after initiation. Primary outcome measure was percentage of patients who receive appropriate monitoring of metabolic parameters at baseline and 12 weeks. If three of four parameters were checked they were considered appropriately monitored. These parameters included BMI, blood pressure, fasting plasma glucose, and fasting lipid profile. Groups will be compared using a chi-square test.

Results pending and to be presented at Great Lakes Residency Conference.

Learning Objectives:

Identify appropriate screening and monitoring guidelines for patients started and maintained on atypical anti-psychotics.

Describe the effects of initiating an ordering template for atypical anti-psychotics on compliance to monitoring guidelines.

Self Assessment Questions:

True or false: Fasting lipid profiles should be checked every 12 weeks after initiation of an atypical anti-psychotic.

List four parameters that should be monitored at baseline when initiating an atypical anti-psychotic.

SAFETY AND EFFICACY OF DOFETILIDE; A RETROSPECTIVE REVIEW.

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Dofetilide is a class III antiarrhythmic indicated for the conversion and maintenance of sinus rhythm (SR) in patients with persistent atrial fibrillation or flutter (AFF). Food and Drug Administration approval was granted in 1999 based on 2 randomized, placebo-controlled trials demonstrating an in-hospital conversion rate of approximately 30%, a 1 year maintenance rate of approximately 60%, and an acceptable safety profile (10.5% incidence of excessive QTc interval prolongation and 0.9% incidence of torsade de pointes [TDP]). However, there is little published evidence of the efficacy and safety of dofetilide in routine clinical practice. This study was performed to determine the efficacy and safety of dofetilide in converting and maintaining SR in a single center “real world” setting with long-term follow-up (up to 5 years).

A retrospective chart review was performed for 129 patients initiated on dofetilide between July 2000 and November 2005 for the treatment of AFF. Efficacy assessment included rates of conversion to SR during dofetilide initiation and long-term dofetilide utilization rates. Safety assessment included monitoring for excessive QTc interval prolongation and TDP. Excessive QTc interval prolongation was defined as >15% increase above baseline after the first dose or >500 msec after any dose (>550 msec in patients with conduction abnormalities).

Thirty-eight patients had persistent AFF (as in randomized trials) and 91 had intermittent AFF. In-hospital conversion to SR occurred in 12 patients (32%) with persistent AFF. Excessive QTc interval prolongation occurred in 36 patients (28%) during dofetilide initiation leading to dofetilide discontinuation in 7 (19%). TDP occurred in 1 patient (0.8%). Long-term dofetilide utilization data is being tabulated.

In our experience, dofetilide is a safe and effective antiarrhythmic drug for the initial conversion of persistent AFF, with results similar to those found in randomized, placebo-controlled trials. Analysis of long-term dofetilide utilization rates is underway.

Learning Objectives:

Compare the efficacy and safety of dofetilide initiation for persistent AFF in clinical practice to that reported in clinical trials.

Examine long-term dofetilide safety and utilization patterns in patients with persistent or intermittent AFF.

Self Assessment Questions:

Dofetilide is as effective at converting persistent atrial fibrillation or flutter in clinical practice as was found in randomized, placebo-controlled trials. T or F

The incidence of torsade de pointes with dofetilide is higher in clinical practice than reported in the literature. T or F

POTENTIAL EFFECT OF VENO-OCCLUSIVE DISEASE (VOD) ON THE HEPATIC CLEARANCE OF TACROLIMUS IN HEMATOPOIETIC STEM-CELL TRANSPLANTATION (HSCT) PATIENTS

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Veno-occlusive disease (VOD) has significant morbidity and mortality in hematopoietic stem-cell transplantation (HSCT) patients, and is usually associated with the conditioning regimen, such as high-dose cyclophosphamide and busulfan. Incidence of VOD was reported to be as high as 54% of HSCT patients. Anatomically, VOD occurs in zone 3 of the liver acinus, where the cytochrome P450 (CYP450) system is located. Theoretically, VOD may cause a decrease in metabolism of various drugs including tacrolimus, which is used in HSCT patients for acute graft-versus-host disease (GVHD) prophylaxis and is a substrate of the CYP450 system.

Retrospective chart review study will include HSCT patients who were diagnosed with VOD within the last three years (2002-2005). Each VOD group subject will have a matched control group subject based on gender, conditioning regimen, and time of VOD onset. The primary endpoint is to compare the adjusted mean tacrolimus trough level between the VOD group and matched control group. The secondary endpoints are the magnitude of change in tacrolimus trough level and the comparison of tacrolimus clearance between both groups.

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

Learning Objectives:

Define the clinical criteria for the diagnosis of VOD.

Describe the methods and procedures for the treatment and prevention of VOD.

Self Assessment Questions:

Which of the following are included in clinical criteria for the diagnosis of VOD?
A.weight gain
B. total bilirubin
C. hepatomegaly
D. all of the above

Which preventive VOD agent(s) has been proven not effective?
A. PGE1
B. heparin and ursodiol
C. heparin and LMWH
D. glutamine

EVALUATION OF APPROPRIATENESS OF LOSARTAN PRESCRIBING FOR HYPERTENSION IN A VETERAN HOSPITAL

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PURPOSE: Nearly one-third of adults in the United States currently have hypertension (HTN). Additionally, approximately 90% of middle-aged Americans will eventually develop high blood pressure in their lifetime, and over 70% of people with hypertension do not have it well controlled. Compelling indications for patients to be treated with an ACE-I or ARB according to JNC VII guidelines include congestive heart failure (CHF) and diabetic nephropathy. The VHA-PBM-Strategic HC Group and MAP have established updated guidelines for the proper use of ARB agents. Guidelines were implemented locally in May 2005. The objective of this study is to assess if other hypertensive agents shown to be effective and less costly by JNCVII have been used prior to initiation of ARB therapy in patients without compelling indications.

METHODOLOGY: Retrospective chart review of all patients age 18-99 years, currently receiving losartan for hypertension as of 4/29/05. Patients with CHF, diabetes mellitus, and proteinuria were excluded. Age, gender, race/ethnicity, provider, all antihypertensive medications currently and within the past two years of losartan initiation, blood pressure (BP) measurements, achievement of BP goal, and allergies/intolerance to antihypertensive agents were collected. Descriptive data analysis included assessment of demographic data, provider, mean dose and duration of losartan therapy, other antihypertensive medication usage, achievement of BP goal, mean BP, and changes in BP.

RESULTS: One hundred charts were randomly reviewed. Within 2 years of initiating losartan therapy, 28% of patients were not given a trial of any other antihypertensive medications. The average duration of losartan therapy was 37 months. Preliminary analysis show that 72% of patients currently on losartan are at their blood pressure goal. A dose of 50mg daily was the most common starting dose of losartan (64% of patients) and current dose prescribed (45%).

CONCLUSIONS:Pending

Learning Objectives:

Summarize the JNCVII guidelines for appropriate use of losartan in blood pressure management

Identify if losartan is being used according to the National VA PBM-MAP criteria for use

Self Assessment Questions:

T or F: Most patients achieved their blood pressure goal when losartan was added onto their existing pharmacotherpy

When is it appropriate to add an ARB onto a patients medication regimen for blood pressure control?

EVALUATION OF CURRENT SEDATION PRACTICE AT UNIVERSITY OF LOUISVILLE HOSPITAL AND DEVELOPMENT OF A SEDATION ORDER SET

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Purpose: Current sedation guidelines published by the Society of Critical Care Medicine (SCCM) recommend having a sedation protocol in place in a critical care setting because research demonstrates that inappropriate sedation practices may lead to increased ventilator time and increased length of stay. Currently there is no established hospital sedation protocol or order set available at University of Louisville Hospital (ULH).

Methodology: This study, which received approval from the Institutional Review Board, was a retrospective chart review of 31 adult patients who received propofol, midazolam, or lorazepam for sedation in an intensive care setting. Guidelines established by the Society of Critical Care Medicine were used to evaluate sedation practice at University of Louisville Hospital.

Results: At ULH, 27.6% of patients had a plan or goal of sedation clearly communicated in the chart as recommended by the SCCM guidelines. Propofol was the most frequently used agent with 27 of 31 patients receiving the agent while in the intensive care unit (ICU). The average length of therapy for propofol was 3.46 days. The majority (77.4%) was prescribed more than one sedative agent during their hospital stay, and many of those (54.8%) received more than one agent concurrently (54.8%). The majority (76%) of patients had sedative doses tapered before discontinuation to prevent withdrawal. Overall, patients spent an average of 11.6 days in the ICU (range 1-43), and were on the ventilator for an average of 8.87 days (range 0-36).

Conclusions: Utilization of a sedation order set will improve communication of sedation and analgesia goals. An order set will also encourage systematic tapering of the dose or daily interruptions of sedation with re-titration to minimize prolonged sedative effects.

Learning Objectives:

Explain the importance of appropriate management of sedation in ICU patients.

Discuss key medications used to sedate ICU patients.

Self Assessment Questions:

Which of the following sedative medications are used in the intensive care unit?
a. Propofol
b. Midazolam
c. Lorazepam
d. All of the above
e. None of the above

True or False: Implementation of sedation guidelines has been shown to decrease ventilator time and length of ICU stay for patients.

EVALUATING THE EFFECTIVENESS OF EDUCATIONAL INTERVENTIONS ON ANTIHYPERTENSIVE MEDICATION ADHERENCE

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Purpose: The purpose of this study was to evaluate the effect of educational mailings on antihypertensive medication adherence rates.

Methods: Prescription claims from a selected employer group were used to identify targeted members. Members who had prescription claims for antihypertensive medications were included in the study. Baseline adherence data was analyzed using the Standardized Therapy Adherence Research Tool (S.T.A.R.T.). Adherence data was analyzed according to antihypertensive drug class. Measures included medication possession ratio (MPR), persistence rates, medication utilization and expenditure analysis. MPRs were calculated based on the days supply of medication acquired relative to the anticipated length of therapy, 90 or 180 days, as an intent to treat analysis. Over a six month period, members received a series of educational interventions through the mail. The interventions educated members on hypertension, medication(s) used to treat hypertension, the importance of adherence, measuring blood pressure, and living a healthy lifestyle. Adherence and persistence rates for all targeted members were evaluated at 3 and 6 months and compared to baseline. To measure if a member's motivation and knowledge of medication adherence improves, a Modified Morisky Score was calculated based on the results of a postcard survey. Members received the six question survey at the beginning and end of the six month period.

Results/Conclusions: Total number of targeted members was 529. Average antihypertensive medication utilization was 1.4 medications per member. Baseline MPR averaged 0.83 for a 90 day time period and 0.70 for a 180 day time period. 12-month persistence rates ranged from 63-83%. There was a 12% response rate to the baseline Modified Morisky Score surveys. Survey results showed 35% of respondents had low motivation and 16% had low knowledge of medication adherence. Data collection is still in progress. More results and conclusions of the study will be presented at the conference.

Learning Objectives:

Describe the incidence of medication non-adherence.

Evaluate tools that can be used to encourage patients to adhere to antihypertensive medication regimens.

Self Assessment Questions:

22% of patients take less of their medication than prescribed? T or F

A Modifed Morisky Score provides insight on a patient's motivation and knowledge of medication adherence? T or F

EVALUATION OF CURRENT TREATMENT OF NEONATAL ABSTINENCE SYNDROME (NAS) AND DEVELOPMENT OF A STANDARD OF CARE FOR THE NEONATAL INTENSIVE CARE UNIT(NICU)

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Background: Neonatal abstinence syndrome (NAS) is a syndrome that results from drug withdrawal and is observed in infants delivered to mothers who are addicted to narcotics and other addictive substances. Infants exposed to drugs in-utero are more likely to suffer from NAS. Currently, there are no national standards for the treatment of NAS. The lack of a standard of care for NAS affected infants poses a problem to their continuity of care.

Purpose: Evaluate current practice at the University of Louisville Hospital for the treatment of NAS in the neonatal intensive care unit (NICU), develop a standard of care for the treatment of opiate withdrawal in these patients, and evaluate treatment of NICU patients following the implementation of the standard of care.

Methods: This project was reviewed and approved by the Institutional Review Board in September 2005. The project was performed in three phases. Phase I was a retrospective chart review of NICU patients that were treated for NAS in the last three years (July 2002-July 2005) in order to obtain information relating to current practices for the treatment of NAS. Phase II involved assisting in the development of multidisciplinary treatment guidelines and the education of NICU staff about these guidelines. Phase III consisted of a post implementation retrospective chart review to evaluate those patients who have received treatment in accordance with the newly developed guidelines.

Results/Conclusions: Twenty-one babies were identified for the retrospective portion of this project. The average length of treatment was 55 days. A multidisciplinary standard of care has been developed and implemented. Results of the post implementation retrospective evaluation will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Define Neonatal Abstinence Syndrome (NAS)

Discuss the new standard of care used at the University of Louisville Hospital

Self Assessment Questions:

Name two drugs that may contribute to traditional neonatal abstinence syndrome?

All of the following are signs and symptoms seen in infants with NAS except
a. Irritability
b. Poor feeding
c. High pitched crying
d. Seizures
e. Lethargy

EVALUATION OF POTENTIAL EXTENDED SPECTRUM BETA-LACTAMASE PRODUCING ESCHERICHIA COLI AND KLEBSIELLA SPECIES IN A MULTI-CENTER HEALTHCARE SYSTEM

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Background
Production of beta-lactamase enzymes is the primary mechanism of resistance in gram-negative organisms for beta-lactam antimicrobials. Beta-lactamases may differ in structure, substrate, response to inhibitors, and mode of transmission. Extended spectrum beta-lactamases (ESBL) are most commonly identified in Escherichia coli, Klebsiella pneumoniae, Klebsiella oxytoca, and Proteus mirabilis. ESBL phenotypes demonstrate varying MICs to ceftazidime, cefotaxime, ceftriaxone, aztreonam, and often beta-lactam/inhibitor combinations. This study was performed to review isolates of Escherichia coli and Klebsiella species collected from patients that demonstrated an ESBL phenotype for the purposes of resistance surveillance within the hospital system.

Methods
This study is a retrospective chart review of patients admitted to Methodist Hospital, Indiana University Hospital, Riley Hospital for Children, or Select Specialty Hospital cultured with isolates of Escherichia coli, Klebsiella pneumoniae, and Klebsiella oxytoca with an ESBL phenotype. A list of patients with positive cultures meeting the inclusion criteria was determined from Clarian Health Partners Infection Control Department. Isolates were excluded from analysis if the patient was not admitted to the hospital, or if the phenotype did not meet inclusion criteria for an ESBL. Data collected will include patient demographics, microbiology data, antimicrobial utilization, infection control measures, hospital and ICU LOS, and disposition. Data analysis will include a comparison of isolates for the participating sites, antimicrobial utilization, and a comparison of the 2005 data with that of previously collected data in 2000-2001.

Results/Conclusion
A total of 147 patients with isolates of E. coli, K. pneumoniae, and K. oxytoca will be included in data analysis. Data collection and analysis in progress.

Learning Objectives:

Identify phenotypic characteristics of extended spectrum beta-lactamase (ESBL) producing organisms.

Recognize risk factors associated with the increased incidence of ESBLs.

Self Assessment Questions:

Which of the following organism(s) are NOT commonly associated with ESBL production?
a. Escherichia coli
b. Streptococcus pneumoniae
c. Proteus mirabilis
d. Klebsiella oxytoca

T/F Third generation cephalosporins utilization is associated with the risk of ESBL production

EFFECT OF DIFFERENCES IN MIC ON CLINICAL OUTCOMES IN PATIENTS WITH GRAM-NEGATIVE BLOODSTREAM INFECTIONS

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Purpose: Fluoroquinolone antibiotics have been shown to be mostly concentration-dependent in the rate of their microbial killing. Pharmacokinetic and pharmacodynamic principles have been employed to optimize their dosing, however evidence is emerging to suggest that current fluoroquinolone dosing strategies may be inadequate. Fluoroquinolone serum concentrations exceeding eight to twelve times the MIC over 24 hours has been shown to optimize clinical outcomes. The current MIC breakpoint for gram negative organisms is 1 mg/L for ciprofloxacin and 2 mg/L for levofloxacin. Achievable serum concentrations of ciprofloxacin and levofloxacin are 3 and 6 mg/L respectively. Because these serum concentrations are only three times that of the current MIC breakpoint, it is hypothesized that current fluoroquinolone susceptibility breakpoints may no longer be appropriate for bloodstream infections. The primary aim of this study was to determine if differences in MIC values among fluoroquinolone-susceptible gram-negative organisms correlated with differences in outcomes in patients with gram-negative bloodstream infections treated with a fluoroquinolone antibiotic.

Methods: A retrospective, observational cohort study was completed. All patients with GNBIs from January 1, 2001 to November 30, 2003 were considered for inclusion. Patients receiving treatment with fluoroquinolones for their GNBIs were identified and evaluated based on the MIC value obtained. Patients were divided into two major groups: those with an organism MIC <0.25 mg/L and those with fluoroquinolone susceptible organisms with MICs >0.25 mg/L. The primary endpoint of the study was mortality. The two groups were assessed for baseline differences including age, co-morbid conditions, and fluoroquinolone agent used. Morbidity outcomes assessed included total cost of care, nursing costs, duration of infection, length of hospital stay, and Charleson score.

Results/Conclusions: 916 patients with gram-negative bloodstream infections were identified. Data analysis is ongoing. Results and conclusions of the study will be presented at the conference.

Learning Objectives:

Discuss the pharmacokinetic and pharmacodynamic profiles of fluoroquinolone antibiotics.

To determine the impact of differing MIC values on outcome in patients with gram negative bloodstream infections at Northwestern Memorial Hospital.

Self Assessment Questions:

True or False: The current fluoroquinolone MIC breakpoint for gram negative organisms is 1 mg/L.

True or False: Fluoroquinolones are mostly time-dependent in the rate of their microbial killing.

POTENTIAL IMPACT OF A PHARMACIST ON ADMISSION MEDICATION RECONCILIATION

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Purpose:
Medication errors are a common problem that afflicts our national healthcare system. Medication reconciliation is a process that is used to potentially decrease the number of medication errors that occur, by acknowledging previous medications that a patient was taking. Starting in December 2005, Munson Medical Center has implemented a medication reconciliation system in which nurses obtain a medication history on admission for the physician to review. Even with this system in place incorrect or missed information, and other medication errors may potentially go unresolved. This project is proposed to determine the accuracy of our current admission reconciliation system, and compare the outcome of pharmacist acquired medication histories. This project intends to demonstrate that a pharmacist's interventions will potentially increase accuracy and display cost savings for the institution.

Methods:
During a four-week period, selected patients who are admitted through the emergency department will have their medication history taken by a pharmacist. During the same time, nurses in the emergency department will take medication histories from another group of patients. The pharmacist or nurse will obtain an accurate medication list for reconciliation and make medication interventions where appropriate. Medication lists from both groups will be compared to the medication history of the internal medicine physician to determine accuracy. Medication interventions that are made will be assigned a cost savings. Previous studies in the literature will provide a validated estimate of cost savings and an analysis of those savings will be calculated.

Results:
Data collection will take place in January 23, 2006-February 17, 2006.

Conclusion:
We propose defining the potential role of a clinical pharmacist in admission medication reconciliation. This project intends to define increased admission reconciliation accuracy and institutional cost savings that potentially exist in this setting.

Learning Objectives:

Identify the potential benefits of pharmacist involvement in medication reconciliation.

Identify the type of interventions that can be made by a pharmacist at the time of reconciliation.

Self Assessment Questions:

What are the top two types of pharmacy interventions that were found in this study?

What differences are found between nurse or pharmacist obtained medication list?

IMPLEMENTATION AND EVALUATION OF A COMMUNITY ACQUIRED PNEUMONIA PATHWAY IN HOSPITALIZED PATIENTS

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Community acquired pneumonia (CAP) is the leading cause of death from infectious disease in the United States, however, appropriate and timely therapy can greatly reduce complications. Appropriate treatment of CAP is currently a measurable outcome required by JCAHO to be evaluated and reported. Implementing a treatment pathway that prompts the practitioner through proper work-up and therapy has been shown to improve compliance with current CAP guidelines leading to improved patient outcomes. The objective of this research is to evaluate the effectiveness of a treatment pathway for CAP at the Cincinnati VAMC.

A written pathway for the treatment of CAP adhering to both the JCAHO standards and the Infectious Disease Society of America guidelines has been developed and approved by the infectious disease and emergency departments. This pathway has been made available to providers at the Cincinnati VAMC through a computerized orderset in the Computerized Patient Record System. Patients with an admitting diagnosis of CAP will be evaluated. Exclusion criteria for patients with CAP diagnosis include: patients transferred from another hospital, patients currently on antibiotics for pneumonia, or patients not receiving any antibiotic therapy within 36 hours of admission. Included charts will be reviewed for compliance with current IDSA guidelines of CAP. Parameters to be reviewed include appropriate antibiotic selection and time to first dose of antibiotics. Data compiled after the implementation of the pathway will then be compared with retrospective data gathered prior to implementation to determine the impact of the clinical pathway.

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

Learning Objectives:

To describe the importance of appropriate treatment of CAP.

To discuss the effect of implementing a clinical pathway and orderset for treatment of CAP.

Self Assessment Questions:

T/F Appropriate treatment of CAP includes administering the first dose of antibiotic within 4 hours of presentation.

T/F Clinical tools, such as an orderset, have been proven to improve compliance with CAP guidelines.

A GASTROESOPHAGEAL REFLUX DISEASE MANAGEMENT PROGRAM IN A COMMUNTIY PHARMACY SETTING

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Objective: About 7% of adults suffer from the symptoms of gastroesophageal reflux disease (GERD) every day. Pharmacists frequently assist many of these patients in choosing appropriate non-prescription medications. This study will seek to evaluate the effect of pharmacist intervention with GERD patients. The primary outcomes being measured are: improved outcomes in frequency of heartburn and compliance, increased rate of appropriate referral to physician for high-risk patients, and favorable view of pharmacist's role in GERD management.

Methods: Subjects will be recruited to participate in the program in a community pharmacy setting. Upon pharmacist recommendation of a non-prescription product for GERD, the subject will be given a survey to obtain baseline information, counseled on how to take the medication and on lifestyle modifications. Subjects will be given follow-up surveys every two weeks to determine progress, need for a new medication, or need for referral to physician. At the end of 8 weeks for each enrolled subject, data and results will be analyzed.

Results: For each enrolled subject, frequency of heartburn, compliance, and adherence to lifestyle modifications will be examined. The rate of referral to physician when a subject is high risk will be evaluated. At the initial visit as well as at each follow-up, subject perception of the pharmacist's role in GERD management will be analyzed.

Conclusions: It is expected that subjects will experience fewer complications and be referred to their physicians if they are high risk at a higher rate with pharmacist intervention. It is also expected that outcomes will be improved with pharmacist intervention, and that subjects will value the role of the pharmacist in GERD management.

Learning Objectives:

Create a plan for lifestyle changes for a given patient with GERD.

Describe the alarm symptoms a patient may present with that may signal a GI disorder.

Self Assessment Questions:

Which of the following are considered appropriate lifestyle changes for a patient with GERD?
a. Stop smoking
b. Eat smaller meals
c. Elevate the head of the bed 4-6 inches
d. Decrease intake of fatty foods
e. All of the above

A patient presents to you with recurring heartburn about an hour after meals. He also says he has a pain in the pit of his stomach that sometimes wakes him up at night. When he has pain in his stomach it is often relieved with eating. What should you recommend?
a. He should take Zantac 150mg 30 mintues before eating to help relieve the pain he feels after eating.
b. He should be referred to his physician.
Why? His symptoms could be associated with an ulcer. He should see his physician for a possible EGD and treatment.

ANALYSIS OF LEVOFLOXACIN UTILIZATION IN PATIENTS WITH COMMUNITY ACQUIRED PNEUMONIA

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Objective: The objective of this study is to evaluate Rush University Medical Center's (RUMC's) use of levofloxacin regimens for community acquired pneumonia (CAP) in regards to appropriate duration, dosage, administration, and drug interactions with di- or tri-valent cation-containing compounds (DTCCs).

Methodology: Study was approved by the Institutional Review Board at RUMC and was designed to include all patients prescribed levofloxacin for the treatment of CAP. Electronic pharmacy records were used to identify patients prescribed levofloxacin. International Classification Disease (ICD9) codes were used to limit this list to patients with CAP. All charts meeting the inclusion criteria were reviewed for potential drug interactions with DTCCs. Drug duration, dose, and route were also evaluated for appropriateness.

Results: A total of 143 patient charts were evaluated and 59 (41 %) patients on levofloxacin had concomitant orders for DTCCs. Of these 59 potential drug interactions, levofloxacin was concomitantly administered with a DTCC in 36 (61%) patients. The most common drugs implicated were calcium 14 (39%) and iron 11 (31%). The average duration of therapy for all three doses of levofloxacin (250 mg, 500 mg, and 750 mg) was 10.5 days. Patients in the 750 mg treatment group had an average duration of 9.4 days, which is longer than the recommended treatment duration of 5 days. Average number of days until levofloxacin IV was changed to oral was 6.4 days. Twenty three percent of patients had doses that were incorrect, based on renal function.

Conclusions: Co-administration of levofloxacin with DTCCs was common at our institution. Patients with orders for DTCCs and levofloxacin received the medications concurrently more than half of the time. Other deficiencies identified were improper dose adjustment for renal function and inappropriate duration for the 750 mg regimen. Education of Pharmacy/Nursing staff is needed.

Learning Objectives:

Understand the implications for co-administering levofloxacin with di- and tri-valent cation-containing compounds.

Recognize medications most commonly associated with levofloxacin interactions.

Self Assessment Questions:

T or F. The correct length of treatment for community acquired pneumonia using 750 mg is 10 days.

T or F. Magnesium is the most common drug associated with levofloxacin interactions in the hospital.

ADHERENCE WITH ADVANCED CARDIAC LIFE SUPPORT GUIDELINES DURING IN-HOSPITAL CARDIAC ARREST

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BACKGROUND: Cardiovascular disease remains the leading cause of death in the United States, with sudden cardiac death comprising more than half of all related deaths. Limited published research has evaluated adherence to advanced cardiac life support (ACLS) guidelines during in-hospital cardiopulmonary arrest. Recent reviews of ACLS practices indicate that an audit of in-hospital resuscitation practices be performed to guide future resuscitation training programs for hospital personnel.

PURPOSE: To evaluate adherence to the American Heart Association (AHA) ACLS guidelines during in-hospital cardiopulmonary arrest in a community teaching hospital.

METHODS: A retrospective sample of consecutive in-hospital cardiopulmonary arrests occurring from January 2003 to December 2004 were evaluated. Patients greater than 18 years of age were included if there was a documented cardiopulmonary arrest record within the patient medical record. All resuscitation interventions were recorded. Non-adherent interventions were classified into the following categories: deviation in sequence of interventions, omission of indicated treatment, incorrect dosage of medication or defibrillation, or time delay in provided intervention. Data were recorded and analyzed using the 2000 AHA recommended guidelines for ACLS along with the AHA/European Resuscitation Council guidelines for reviewing, reporting, and conducting research on in-hospital resuscitation (the in-hospital “Utstein Style”).

RESULTS/CONCLUSIONS: To date, a total of 74 records have been reviewed resulting in 650 treatment interventions. Preliminary results indicate non-adherence in 10.6% of resuscitation interventions. Further analysis of data will be presented at the Great Lakes Pharmacy Resident Conference. Patterns identified as a result of deviation in practice from ACLS guidelines can be used to assist in the direction and guidance of future ACLS education efforts.

Learning Objectives:

To identify the potential areas of non-adherence within ACLS guidelines during in-hospital cardiopulmonary arrest.

To determine the impact of an audit of resuscitation practices on the development of a directed educational process for future ACLS education efforts

Self Assessment Questions:

True/False: To maintain consistency within published literature on in-hospital resuscitation, one should follow the “Utstein Style” of reporting.

True/False: An audit of in-hospital resuscitation practices could be used to guide future education efforts at both the local and national level.

DEVELOPMENT AND EVALUATION OF A COMMUNITY PHARMACY HEART FAILURE MANAGEMENT PROGRAM.

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Background/Purpose: Individuals with heart failure take at least 4 medications, and as many as 50% admit to medication nonadherence. Pharmacists' involvement in the care of patients with heart failure has been shown to improve medication adherence and lower emergency room and hospital visits. Community pharmacists play an important role in medication management and are positioned to identify patients with heart failure. The primary objective of this study is to develop and evaluate a community pharmacy heart failure management program.

Methods: This study will assess fifty patients with documented heart failure in one Chicagoland community pharmacy. Pharmacists will provide patients with an initial standardized medication review and comprehensive disease education. Subjects will complete 3 surveys at 0, 3, and 6 months. Mid-point and final medication review and abbreviated disease education at 3 and 6 months, respectively, will also be performed. Pharmacists' recommendations for optimization and adjustment of medications will be discussed with primary healthcare providers. Weight, blood pressure, heart rate, symptoms, and adherence will be monitored during each monthly visit.

RESULTS: Data collection is currently in progress. Results will be presented during the Great Lakes Regional Residency Conference.

CONCLUSIONS: It is anticipated that as a result of pharmacist intervention, patients with heart failure will improve disease knowledge, medication adherence, and satisfaction with their medication regimen. Pharmacist interventions in heart failure management are predicted to optimize patient's blood pressure, weight, and medication regimen.

Learning Objectives:

Identify factors contributing to poor disease control in patients with heart failure.

Describe tools which community pharmacists may employ to improve outcomes in patients with heart failure.

Self Assessment Questions:

True/False. Patients with heart failure typically exhibit high adherence rates to medication regimens.

True/False. Heart failure symptom assessment surveys are difficult to incorporate into the workflow of community pharmacies.

USE OF METFORMIN VERSUS GLYBURIDE FOR TREATMENT OF POST TRANSPLANT DIABETES MELLITUS IN LIVER TRANSPLANT RECIPIENTS.

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Post transplant diabetes mellitus (PTDM) has an estimated frequency of 2-50% compared to an incidence of diabetes mellitus of approximately 4% in the non-tranpslant population. It is associated with a cost increase compared to transplant recipients without PTDM and is an independent risk factor for cardiovascular complications which may lead to increased morbidity and mortality.

Currently, only insulin has been widely utilized as therapy for PTDM. Unfortunately, its use is associated with poor compliance rates and a high incidence of hypoglycemia. In a cohort study looking at the incidence of hypoglycemia in insulin users, severe hypoglycemic episodes occurred in approximately 20% of patients. Ninety-four percent of these episodes required emergency department treatment.

Metformin is commonly used to treat diabetes mellitus in non-transplant patients. It is a favorable alternative to insulin due to its efficacy, few drug interactions and side effects. Little evidence exists that metformin alone causes hypoglycemia. In addition, other beneficial effects include weight loss and lipid lowering. Presently, no prospective studies exist evaluating the safety and efficacy of metformin in PTDM.

Purpose:
To evaluate the safety and efficacy of metformin in reducing blood glucose compared to glyburide in liver transplant patients with PTDM.

Methods:
Patients who meet enrollment criteria are randomized to receive either metformin, starting at 500 mg daily, increased by 500 mg weekly to a maximum dose of 2500 mg or glyburide 2.5 mg daily, increased by 2.5 mg to 5 mg weekly to a maximum of 20 mg per day. Dose titration is based on drug tolerance, fasting blood sugars greater than 126 mg/dL and self-monitored blood glucose logs. Data collected includes demographic data, immunosuppression regimen, hemoglobin A1C, fasting lipid profile, liver profile, fasting glucose levels, insulin use, and BMI.

Results/Conclusions:
Patient enrollment is still ongoing. Data collected will be presented at the conference.

Learning Objectives:

To evaluate the incidence, etiology, and implications of post transplant diabetes.

To evaluate safety and efficacy of metformin in post transplant diabetic liver patients.

Self Assessment Questions:

Which of the following immunosuppressant medications possesses the greatest propensity to induce PTDM?

a) tacrolimus
b) cyclosporine
c) mycophenolate mofetil

True/False: The mechanism by which calcineurin inhibitors cause PTDM is due to impaired islet cell response to blood glucose.

FEASIBILITY OF AN INFECTIOUS DISEASE PHARMACIST IN AN ACADEMIC INFECTIOUS DISEASE CLINIC

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Infectious disease clinics are encountering an increasing number of patients with chronic infection. Pharmacists have a unique training and knowledge base suiting them to optimally assist in improving drug safety and efficacy, patient compliance, and ultimately, clinical outcomes.

Froedtert Hospital infectious disease (ID) clinic sees approximately 400 patients infected with human immunodeficiency virus (HIV) on a quarterly basis and follows approximately 600 non-HIV related patients per six month period. Current pharmacy involvement is limited to once weekly four hour pharmacy resident rotations. Opportunities for pharmacy services include: conducting medication histories, new medication teaching, managing complicated regimens with numerous drug interactions, providing compliance follow-ups, expanding clinical trial participation, acting as a staff resource, soliciting manufacturer drug programs, and acting as a liaison between acute and ambulatory settings.

The objective of this study is to develop, validate and financially justify a pharmacist position in an academic ID clinic.

Pharmacy and ID clinic staff ideas, communication with other facilities, and current literature were utilized to identify potential designs for an ID pharmacist position. Case reports of prescription dispensing errors and error rates documented in the literature were reviewed and potential safety benefits of an ID pharmacist were identified. Clinic prescriptions filled at Froedtert Hospital outpatient pharmacies were tracked for three weeks. Potential revenue from increased prescriptions was based on this data and average prescription margin data obtained from the outpatient pharmacies. Patient population data and estimates of HIV patients requiring additional monitoring will be used to estimate potential pharmaceutical care opportunities. Payment will be based on Medicare reimbursement categories and reimbursement rates. Finally, potential revenues from clinical trial participation will be estimated based on current trial participation and fees. Safety, therapeutic outcomes and financial benefits will be summarized and presented to management.

Analysis is ongoing. Results will be presented at Great Lakes Conference.

Learning Objectives:

To assess the potential roles for pharmacy in an academic infectious disease clinic.

To identify and analyze key aspects for establishing a new pharmacist position.

Self Assessment Questions:

Critical errors in dispensing anti-retrovirals can be controlled by implementing a full-time infectious disease pharmacist.

Creating new pharmacist positions to fill unmet needs can be achieved by identifying safety, efficacy and financial benefits.

EVALUATION OF STANDARD VANCOMYCIN DOSING VERSUS AGGRESSIVE DOSING IN PATIENTS WITH STAPHYLOCOCCUS AUREUS PNEUMONIA.

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Purpose:
Vancomycin, a glycopeptide antibiotic, is commonly used to treat Staphylococcus aureus (S. aureus) pneumonia. Standard dosing strategies have targeted vancomycin troughs of 5-15 mcg/ml. The American Thoracic Society (ATS) and the Infectious Diseases Society of America (IDSA) recommend that patients treated with vancomycin for healthcare-associated pneumonia be dosed to achieve serum trough levels of 15-20 mcg/ml. These recommendations were based on studies that have documented clinical failure rates in up to 40% of patients being treated with standard vancomycin doses. It has also been shown that vancomycin has poor penetration into lung tissue suggesting that higher trough concentrations may lead to higher lung concentrations and better outcomes in pneumonia patients. The objective of this study is to compare clinical outcomes and safety profiles in S. aureus pneumonia patients with vancomycin troughs of 5-15 mcg/ml to those with troughs of 15-20 mcg/ml.

Methods:
Current practice at our institution is for the pharmacy-run pharmacokinetic program to dose vancomycin to troughs of 5-15 mcg/ml. A retrospective review of patients who had been diagnosed with S. aureus pneumonia between November 1, 2004, and May 31, 2005, and who were treated with vancomycin to achieve a trough of 5-15 mcg/ml was conducted. A prospective review that started in July, 2005 is being conducted on patients diagnosed with S. aureus pneumonia treated with vancomycin dosed to achieve trough levels of 15-20 mcg/ml. The following data is being collected for all patients: white blood cell counts, serum creatinine, maximum temperature, time to normalization of white blood cell count and temperature, signs and symptoms of infection, concomitant antibiotics, length of vancomycin therapy, and length of hospital stay and mortality. Clinical and safety outcomes will be compared between the two patient groups to determine if there is benefit of troughs of 15-20 mcg/ml for S. aureus pneumonia.

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

Learning Objectives:

Discuss the Rationale for use of aggressive vancomycin dosing in S. aureus pneumonia patients.

Describe the clinical outcomes associated with aggressive dosing of vancomycin in S. aureus pneumonia

Self Assessment Questions:

True or False Recommended trough levels of vancomycin for treatment of health-care associated pneumonia is 15-20 mcg/ml.

True or False Intravenous antibiotic therapy within the previous 30 days is a risk factor for health-care associated pneumonia.

EVALUATION OF ADRENAL FUNCTION IN CRITICALLY ILL PATIENTS AFTER A SINGLE BOLUS DOSE OF ETOMIDATE

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Objective: Etomidate, widely used for the facilitation of endotracheal intubation, may cause reversible inhibition of cortisol. It is also no longer utilized as a continuous infusion in critically ill patients because it has been associated with an increase in mortality. In addition to this, there have only been a small number of trials evaluating the effects of a single bolus dose of etomidate on adrenal dysfunction in critically ill patients. The purpose of this study is to determine if there is an association between the use of a single bolus dose of etomidate and adrenal suppression in critically ill patients at Akron General Medical Center.

Methods: This study is a descriptive retrospective chart review. Patients were included if they were mechanically ventilated and received a corticotropin stimulation test. They were excluded if they had a prior history of steroid use or a history of adrenal dysfunction. After data collection, patients will be divided into two groups responders and non-responders. Non-responders are defined as patients with an absolute change in cortisol concentration less than 9 mcg/dl after receiving a cortisol stimulation test. The primary end point of this study compares the proportion of responders to non-responders who received etomidate. The secondary endpoint compares the proportion of responders to non-responders in various confounding subgroups as well as outcomes. The data analysis will be preformed using appropriate statistical tests.

Results/conclusions: To be presented.

Learning Objectives:

Discuss the effect of etomidate on adrenal function in critically ill patients.

Explain the results and conclusions of the study and how it applies to clinical practice.

Self Assessment Questions:

T/F Etomidate is thought to inhibit cortisol by disrupting steroidogenesis.

T/F Adrenal dysfunction can lead to hypotension.

EVALUATION OF INITIAL MANAGEMENT AND EFFECT OF AN IV ANTIBIOTIC ADMINISTRATION PROTOCOL IN PATIENTS WITH SUSPECTED BACTERIAL MENINGITIS IN THE EMERGENCY DEPARTMENT

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Background: Bacterial meningitis is a major cause of mortality worldwide, accounting for approximately 135,000 deaths yearly. Efficient and appropriate management of meningitis in the Emergency Department (ED) may potentially reduce mortality to below 15%. In May 2005, the Antimicrobial Subcommittee at Northwestern Memorial Hospital (NMH) instituted a protocol for IV antibiotic administration in the ED in an effort to expedite the delivery of antibiotics in critical situations, including meningitis.

Purpose: The study will evaluate adherence to the Infectious Diseases Society of America (IDSA) practice guidelines for initial management of suspected bacterial meningitis in the ED, as well as evaluate the impact of the IV antibiotic administration protocol on time to first dose of antibiotics. The primary endpoint of this quality improvement project is adherence to IDSA guidelines based on time to lumbar puncture and blood culture, appropriateness of empiric antibiotic therapy, and frequency of use of adjunctive therapy, specifically dexamethasone and acyclovir. Additionally, improvement in time to antibiotic administration after implementation of the protocol will be evaluated. Secondary endpoints are time to inpatient admission, number of inpatient days, and patient survival at discharge.

Methods/ Results: This Institutional Review Board-approved study is a retrospective medical record review of patients with suspected bacterial meningitis presenting to the NMH ED between November 1, 2004 and November 30, 2005. Study endpoints obtained pre- and post-protocol implementation will be evaluated using t test or chi-square test for continuous or nominal data, respectively. Upon evaluation of adherence to published guidelines, the authors will identify and address management areas which need improvement.

Conclusions: This study will describe current practice and identify areas for improvement in the initial management of bacterial meningitis in the ED. Specifically, the study investigators hypothesize that implementation of the IV antibiotic protocol has decreased the time to antibiotic administration in this patient population.

Learning Objectives:

To discuss and promote the use of the Infectious Diseases Society of America (IDSA) practice guidelines in the management of suspected bacterial meningitis.

To determine if implementation of an IV Antibiotic Administration Protocol improved time to antibiotic administration in the Emergency Department.

Self Assessment Questions:

True or False: The first dose of antibiotics should be administered immediately after LP is performed and cerebral spinal fluid is obtained.

True or False: Appropriate empiric therapy for suspected S. pneumoniae meningitis includes vancomycin plus a third generation cephalosporin such as ceftriaxone or cefotaxime

EFFECT OF A CLINICAL PROTOCOL IN THE MANAGEMENT OF VENTILATOR ASSOCIATED PNEUMONIA IN A SURGICAL INTENSIVE CARE UNIT

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Ventilator-associated pneumonia (VAP) is a leading cause of morbidity and mortality in the intensive care unit. Previous studies have demonstrated that implementation of a clinical guideline for the treatment of VAP increases the initial administration of adequate antimicrobial treatment and decreases the overall duration of antibiotic treatment. Based upon guidelines published by the American Thoracic Society and Infectious Disease Society of America, a new protocol for the diagnosis and treatment of VAP has been developed and implemented in the Surgical Intensive Care Unit (SICU) at the University Hospital in Cincinnati, Ohio. The purpose of this study was to evaluate the effects of implementation of this new clinical protocol.

All patients >=18 years old admitted to the SICU at the University Hospital who developed VAP were eligible for inclusion to the study. Patients that met inclusion criteria were separated into two groups and compared. Those patients that were treated for VAP prior to the implementation of the current VAP protocol were deemed the “control group”, whereas patients that were diagnosed and treated for VAP according to the new protocol were deemed the “study group”.

The primary endpoint of the study will be adequacy of empiric therapy, defined as initial empiric treatment with at least one antibiotic with demonstrated in vitro activity against the identified bacterial species. Secondary endpoints include the following: rate of protocol adherence; duration of antibiotic therapy for VAP; total days of antibiotic therapy in ICU; duration of mechanical ventilation; ICU and hospital lengths of stay; time to clinical resolution; pulmonary infection recurrence rate; predictability of Gram's stain and preliminary culture results for final culture results. Descriptive statistics will be employed to analyze the data. Data collection is currently in progress and the analysis of results is pending.

Learning Objectives:

Discuss the morbidity and mortality associated with ventilator associated pneumonia in critically ill patients.

Understand the importance of providing appropriate initial antimicrobial therapy for the empiric treatment of pneumonia.

Self Assessment Questions:

True or False: Current ATS/IDSA guidelines suggest that treatment of ventilator associated pneumonia be based on the onset (early vs. late) of the disease.

VAP is associated with:
a. A crude mortality rate of 24-76%
b. Prolonged time on mechanical ventilation
c. Prolonged ICU length of stay
d. All of the above

EFFECT OF CONTINUOUS ENTERAL NUTRITION ON THE BIOAVAILABILITY OF ITRACONAZOLE ORAL SOLUTION

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Purpose: Itraconazole is a triazole antifungal agent with broad-spectrum activity used for the prophylaxis and treatment of fungal infections. Itraconazole has been formulated with hydroxypropyl-beta-cyclodextrin in an oral solution, which offers improved bioavailability as compared to the oral capsule formulation. In contrast to the oral capsule formulation, the bioavailability of itraconazole oral solution is optimized when administered in the fasted versus fed state. It is not known if enteral nutrition formulas interfere with the bioavailability of itraconazole oral solution. We intend to determine the effect of continuous enteral nutrition on the bioavailability of oral itraconazole solution in healthy volunteers.

Methods: The study will be conducted as a prospective, randomized, cross-over design. A total of 36 healthy adult volunteers will be recruited to participate in the study, and each will undergo three separate phases of study. Phase A will consist of itraconazole given in the fasted state, Phase B will consist of itraconazole given concurrently with continuous enteral nutrition, and Phase C will consist of itraconazole given with continuous enteral nutrition when the infusion is interrupted before and after the dose. Pharmacokinetic analysis will be performed on each subject in each of three phases to determine AUC, Cmax, and Tmax of itraconazole. The study has been approved by the University of Michigan Institutional Review Board, and written informed consent will be obtained from all subjects prior to initiation of any study interventions. The results of this study will be useful to clinicians prescribing and administering itraconazole oral solution to patients receiving continuous enteral nutrition.

Results/Conclusion: Pending upon completion of the study.

Learning Objectives:

Compare the bioavailability of itraconazole capsules with itraconazole oral solution in the following clinical situations: patients receiving acid-suppressive therapy, and patients taking drug in the fed state.

Explain the reasons for concern with the administration of itraconazole oral solution with concurrent enteral feedings.

Self Assessment Questions:

Itraconazole capsules display superior bioavailability, when compared to itraconazole oral solution, in which of the following situations:
a. Patients receiving acid-suppressive medications
b. Patients in the fed state
c. Both of the above scenarios
d. Neither of the above scenarios

Which of the following agents is NOT thought to interact with enteral tube feedings?
a. Phenytoin
b. Ciprofloxacin
c. Warfarin
d. All of the above interact with enteral tube feedings

CQI OF AMBULATORY MEDICATION SAFETY BASED ON MIDAS REPORTING

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Background
Improving medication safety is a fundamental goal imbedded into all aspects of pharmacy. According to a press release in 2003, the Institute of Medicine estimated thousands of medical errors occur in nursing homes and clinics every year. The Joint Commission International Center for Patient Safety supports the development of an effective reporting system for medical/health care errors in a non-punitive environment. . Currently a reporting system, MIDAS, has been developed for Saint Joseph Regional Medical Center; however, it is being underutilized in the ambulatory care setting. The purpose of this study was to improve utilization of MIDAS and assess effectiveness of enhancing medication safety after reporting occurs. Additionally, analysis of classifications medication errors in the ambulatory setting will be conducted.

Methods
We performed a prospective study at two ambulatory primary care practice sites in South Bend and Mishawaka, IN. One practice utilized an electronic medical record system and the other practice utilized paper charts. A clinical practice reporting form was developed for data collection of each medication error or adverse drug reaction occurrence. A short presentation at each site was conducted to explain the study and familiarize participants with the reporting forms to be used. Residents, physicians, nurses, technicians, and pharmacists were encouraged to voluntarily report medication errors and adverse drug reactions as they occurred using the clinical practice reporting form developed for this study. The pharmacist then entered these reports into MIDAS. Quarterly reports were obtained to assess need for procedural changes or educational interventions to reduce future risk.

Results/Conclusion
Preliminary results and conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:

Discuss the role of a pharmacist in reporting medication error and adverse drug event in the ambulatory setting.

Discuss results of our study and how it impacts clinical practice

Self Assessment Questions:

T or F Performance Improvement Methodology includes: Plan, Do, Check, Act

What are the most commonly reported errors?

OPTIMIZING HOSPITAL GLYCEMIC CONTROL WITH THE USE OF INSULIN THERAPY IN NON-CRITICALLY ILL DIABETIC PATIENTS: IMPROVED MANAGEMENT OF HYPERGLYCEMIA AND HYPOGLYCEMIA

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Introduction/Background: Diabetes is an increasing problem in United States. In the last decade Americans with diabetes has increased by 80 percent. According to the Centers for Disease Control nearly 21 million Americans are believed to be diabetic, and 41 million more are pre-diabetic. The cost of diabetes is conservatively estimated to be $132 billion dollars combining loss of work days and health care related expenses. Published studies have shown that tight glycemic control in critical care patients with diabetes mellitus has reduced mortality, infection, and the length of hospital stay. There is limited information on tight glycemic control in the non-critically ill. Hospitalized patients with diabetes traditionally receive insulin on a sliding scale regimen, but the benefits of this course of therapy are not clear due to a reactive approach to glycemic control.

Purpose: To evaluate current hospital glycemic control in non-critically ill patients and to implement a system to improve the management of hyperglycemia.

Methods: Hospitalized patients will be evaluated on their glucose levels, type of insulin therapy, complications (hypoglycemia, hyperglycemia, and documented nosocomial infections), and length of stay. Laboratory information will be collected on general medicine patients with glucose levels >150mg/dl. A list of patients will be generated of patients with glucose levels <40mg/dl or >400mg/dL, to identify patients with hypoglycemic or hyperglycemic events. Patients will be monitored on admission for any signs of infection and any cultures will be reviewed. Nosocomially acquired infections will be defined as an infection occurring on or after hospital day three. Statistical analysis will be performed on the data collected.

Results: Data analysis is currently in progress and finalized data will be presented at a later time.

Conclusion: It is anticipated that this study will help decrease the incidence of hyperglycemia and hypoglycemia and decrease complications that lead to an increase in hospital length of stay.

Learning Objectives:

To determine clinical outcomes of tight glycemic control in non-critically ill patients.

To identify patient the risk factors for developing hypoglycemic, hyperglycemic, and infection complications in non-critically ill patients.

Self Assessment Questions:

True/False: Sliding Scale Insulin is a proactive measure of controlling blood glucose levels.

Should insulin coverage be added to all hospital patients?

CHARACTERIZATION, TREATMENT, AND OUTCOMES OF CANDIDEMIA IN ADULTS

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Candida species are the most common cause of fungal infections. They are the fourth most common bloodstream isolate in hospitals in the United States. Candida albicans remains the most common pathogen in oropharyngeal and cutaneous fungal infections, but non-albicans species of Candida are becoming increasingly associated with invasive candidal infections. These infections can lead to significant morbidity and mortality. Prophylaxis with antifungal agents can lead to a decreased incidence of candidemia, but a possible increase in the incidence of resistant species of Candida. In general, amphotericin B based preparations, the azole antifungal agents, and the echinocandin antifungal agents play a role in treatment.

The purpose of the study is to characterize candidal blood stream infections in adults at our institution. Secondary objectives include description of treatment course, prophylaxis practices, and patient outcomes.

A retrospective, descriptive chart review of all adults at MetroHealth Medical Center with a blood culture positive for Candida species from January 2001- December 2004 was undertaken. Patients were identified by searching the microbiology laboratory database for the aforementioned criteria. Data collection included demographics, comorbid illnesses, cultures and sensitivities, treatment regimens, duration of therapy, and patient outcomes. Patient outcomes included mortality, complications, and the time to microbial eradication.

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

Learning Objectives:

Identify factors that increase a patient's risk of developing candidal blood stream infections.

Discuss treatment options for the management of candidal fungemia.

Self Assessment Questions:

Non-albicans species of Candida are becoming increasingly associated with invasive candidal infections. T or F

What is the recommended duration of treatment in a non-neutropenic adult with candidemia?

COMPARISON OF INTRAVENOUS IMMUNE GLOBULIN (IVIG) TO CYTOMEGALOVIRUS IMMUNE GLOBULIN (CMVIG) IN KIDNEY TRANSPLANT DESENSITIZATION

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Background/Objective: Highly sensitized potential kidney transplant patients with preformed antibodies to human leukocyte antigens (HLA) have reduced allograft survival rates. Approximately 20 to 30% of patients on the waiting list are highly sensitized due to previous transplants, pregnancy, or transfusions. Plasmapheresis has been used to remove anti-HLA antibodies. Research shows that both IVIG and CMVIG are effective at reducing anti-HLA antibodies in highly sensitized patients and therefore may be used in desensitization protocols. Desensitization with intravenous immune globulin allows potential transplant patients who were previously unable to undergo transplantation due to sensitization of HLA antigens to become suitable candidates for transplantation. Since November 2003, approximately 30 patients have completed kidney transplant desensitization at The Ohio State University Medical Center (OSUMC).

The primary objective of this study is to compare graft survival in patients who received IVIG or CMVIG as part of the kidney transplant desensitization protocol at OSUMC.

Methods: A retrospective chart review, from November 2003 to June 2005, was performed on all kidney transplant patients receiving IVIG (n=11) or CMVIG (n=13) for desensitization. Data collection included baseline characteristics (age, gender, race, weight, height, etiology of renal failure, blood transfusions, prior pregnancies, and previous transplants). Transplant data collected included type of donor, rejection information (type of rejection, post-transplant day of rejection, serum creatinine at time of rejection, therapy for rejection), and induction and immunosuppressive therapy. Intravenous immune globulin data collected included number of doses, type of intravenous immune globulin, infusion time, and infusion reactions. In addition, most recent serum creatinine, graft functionality, splenectomy, and survival were noted.

Results/Conclusions: Preliminary data, collected on eight patients receiving CMVIG, show that four patients have functioning grafts, two patients have nonfunctioning grafts, and three patients expired. Data collection is ongoing and further results will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Become familiar with the immune mechanisms involved in potential transplant patients that are highly sensitized and the causes of such sensitivity

Describe the difference in outcomes between patients receiving IVIG and CMVIG for transplant desensitization

Self Assessment Questions:

True or False. The reasons that a patient may be highly sensitized include pregnancy, previous transplant, and transfusion.

True or False. Both CMVIG and IVIG have been used successfully in kidney transplant desensitization protocols

IMPACT OF A NEW METHOD OF MEDICATION RECONCILATION ON INPATIENT CARE

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BACKGROUND

Accurate and complete reconciliation of medications across the continuum of care has been highlighted by the Joint Commission on Accreditation of Healthcare Organizations as a National Patient Safety Goal, and was also issued as a Sentinel Event Alert. Furthermore, the American Society of Health-System Pharmacists has identified pharmacist involvement in medication histories as a goal within its 2015 Initiative. Specifically, the objective states that pharmacists will be involved in managing the acquisition, upon admission, of medication histories for 75% of hospital inpatients with complex and high-risk medication regimens. A Failure Modes and Effects Analysis was completed to identify, prioritize, and resolve flaws in the current method of medication reconciliation at a large teaching hospital. Of note, the top three potential failure modes identified were directly related to inaccurate medication histories.

PURPOSE

To evaluate the impact of a newly developed medication reconciliation form on inpatient care.

METHODS

A retrospective review of randomly selected patients admitted through the Emergency Department has been conducted. Through use of a data collection form, medication histories were evaluated for completeness, including but not limited to dosages, frequency, allergy information, and use of any herbal supplements. Deviation from home regimens was investigated for justification. A post-analysis using the same data collection form will be conducted after implementation of a newly developed reconciliation form. Only English speaking patients aged 50 years or older admitted to a general medical floor will be included in both analyses.

PRELIMINARY RESULTS

Fifty charts were randomly selected and reviewed for the pre-analysis. A total of 195 discrepancies occurred, an average of 3.9 per patient. Thirty-seven medications were unreconciled within 24 hours, seven of which were ordered in deviation from the home regimen without clear justification. Final results and conclusion will be presented at the conference.

Learning Objectives:

To understand the lack of continuity in patient care and medication therapy upon admission to a hospital.

To identify the need for pharmacist involvement in reconciling medications of patients with complex regimens.

Self Assessment Questions:

True or False: ASHP has identified pharmacist involvement in medication histories as a goal within its 2015 Initiative.

True of False: Medication reconciliation includes verification, clarification, and reconciliation of medication orders at all interfaces of care.

DOCUMENTATION OF DRUG INFORMATION REQUESTS AT A VETERANS AFFAIRS MEDICAL CENTER

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Purpose: The American Society of Health-System Pharmacists (ASHP) outlines accreditation standards for pharmacy practice residencies, which include Guidelines on the Provision of Medication Information by Pharmacists. Currently, the Roudebush VA Medical Center does not have an established system to document drug information requests and responses.

The primary objective of this study was to evaluate the types of drug information requests pharmacists receive and the quality and impact of responses provided. An appropriate drug information documentation protocol and procedure will be developed based on the results.

Methods: A drug information data sheet was developed. Data collected on this form included: date, provider, patient identifier, nature of inquiry, brief summary of request, and total time to complete request. Questions regarding prevention of adverse reactions, alterations in therapy or resultant cost savings were also included on the documentation form. Following completion of the data collection period, an appropriate documentation protocol will be developed. The documentation process will parallel information reflected by the data collection sheet, such as number of requests, time dedicated to inquiries, and comments noted. The documentation process will be designed to comply with ASHP drug information standards.

Preliminary Results: Over a four month time period, forty-six drug information data sheets have been collected. A majority of DI requests, 56.5%, take between 15-60 minutes to complete the response. Questions related to dosing, drug interactions or contraindications, and optimal choice of therapy have been among the most prevalent types of questions being asked of pharmacists. The responses provided resulted in alterations in therapy in 30.4% of cases.

Conclusions: The development of a drug information documentation system at the Roudebush VA Medical Center is necessary and will facilitate the ability for quality assessment initiatives. Potential access to the development of an electronic database through collaboration with additional institutions is being pursued.

Learning Objectives:

Recognize and justify the need for documentation of drug information requests and responses.

List the benefits of establishing a drug information documentation system.

Self Assessment Questions:

T/F ASHP and JCAHO describe standards pertaining to drug information documentation processes and measures to assess quality of responses provided.

Quality drug information responses and subsequent documentation have the potential to:
a) Enhance patient care
b) Educate providers about medications and current evidence-based medicine
c) Track frequency of common questions that may indicate need for education
d) All of the above

EVALUATION OF THE EFFICACY OF APREPITANT THERAPY IN PATIENTS RECEIVING MAID CHEMOTHERAPY FOR SARCOMA.

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Background: Recently at The Arthur G. James Cancer Hospital, aprepitant, a neurokinin-1 receptor antagonist, has been added to ondansetron and dexamethasone for prevention of acute and delayed emesis in patients receiving MAID (mesna, doxorubicin, ifosfamide, and dacarbazine) chemotherapy for sarcoma. The dose of aprepitant used is 125 mg PO on Day 1, followed by 80 mg PO on Days 2-4.

Objective: To assess the efficacy of aprepitant in controlling acute and delayed chemotherapy induced nausea and vomiting in patients receiving MAID therapy for sarcoma.

Methods: This study received approval by the Institutional Review Board. Patients were included if they met the following criteria: greater than 18 years of age; diagnosis of sarcoma; received MAID therapy; and no aprepitant therapy (group 1) or 4 days of aprepitant (group 2). Subjects were identified through a query of the pharmacy database for calendar year 2004 (group 1) and calendar year 2005 (group 2). Data was collected regarding the number of emetic episodes, patient reported nausea score, medication utilization in controlling acute and delayed nausea and vomiting, and incidence of delays in chemotherapy. Group 1 and group 2 will be compared to determine if there is a difference between the two groups with respect to the efficacy of their anti-emetic regimen.

Results: To date, 33 charts have been reviewed for patients that did not receive aprepitant. The median number of emetic episodes per 24 hour period were 5, 2, 5, and 4 for the 4 days following the initiation of chemotherapy. Preliminary results for the 13 charts that have been reviewed of patients receiving aprepitant indicate a median number of emetic episodes of 0, 0, 0, and 2 for the same time period.

Learning Objectives:

Describe risk factors for chemotherapy induced nausea and vomiting (CINV).

List the NCCN recommended therapies for highly emetogenic chemotherapy regimens.

Self Assessment Questions:

True of False Aprepitant is metabolized by the CYP3A4 isoenzyme.

True or False Aprepitant is not recommended by the NCCN as prevention therapy for a highly emetogenic chemotherapy regimen.

MANAGEMENT OF HYPERTENSION IN VA PATIENTS CONVERTED FROM TRANSDERMAL TO ORAL CLONIDINE: A RETROSPECTIVE STUDY.

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Therapeutic interchange during formulary management is a means by which institutions can reduce costs while maintaining treatment efficacy and safety for their patients. Recently, the Jesse Brown Veterans Affairs Medical Center (JBVAMC) implemented a formulary change which resulted in conversion of patients from clonidine patch (Catapres-TTS®) to oral clonidine tablets (Catapres®). There is guidance for tapering off the oral formulation and for the conversion of hypertensive patients from the oral tablets to the transdermal patch. However, there is a lack of data evaluating patients converted from transdermal clonidine to oral clonidine as part of a formulary conversion initiative.

The purpose of this retrospective study is to evaluate the conversion methods utilized when patients were switched from a clonidine patch to the oral formulation at the JBVAMC. On a more global level, this study will allow for an analysis of blood pressure response and safety when converting patients from a clonidine patch to tablets, which may help guide others in a similar situation.

Patients diagnosed with hypertension and who had an active prescription for the clonidine transdermal patch prior to May, 1 2005 were included for evaluation. A list of patients meeting this criteria was generated via the hospital's medical record system. Patients who were unable to take medicines by mouth or who were on dialysis were excluded from the final study analysis as they would not have been converted to the oral formulation. Data collection will include; dose of clonidine patch prior to conversion, dose and schedule of oral clonidine at conversion, final maintenance dose and schedule or oral clonidine, blood pressure and heart rate prior to and after conversion, time to scheduled follow-up after conversion, and any adverse effects attributed to clonidine. Data collection is ongoing. Results and conclusions of the study will be presented at the conference.

Learning Objectives:

To evaluate the blood pressure response and safety when converting patients from a clonidine patch to tablets.

To discuss possible recommendations on dose conversions when converting from clonidine patch to tablets.

Self Assessment Questions:

Oral clonidine should be started immediately after removing the patch (within 6-8 hours). T or F

Patients' blood pressure can be equivalently controlled when switched from transdermal clonidine to a titrated oral dose. T or F

IMPLEMENTATION OF A COMMUNICATION TOOL TO ASSESS THE EFFECTIVENESS OF A PHARMACY MANAGED MEDICATION RECONCILIATION PROGRAM

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Background:
Medication reconciliation is a process of identifying the most accurate list of all medications a patient is taking and using this list to identify discrepancies with inpatient medications and ultimately provide a correct medication history to all health care providers from the time of admission. At our institution, the medication reconciliation program is under pharmacy management and we have designed a prospective study to assess the therapeutic value of the program.

Purpose:
The purpose of this study is to develop a communication tool which can be used to document and assess the outcomes of communication between the pharmacist and the corresponding physician after the implementation of a hospital wide medication reconciliation program in January, 2006.

Study Objectives:
1. To identify the most effective method to communicate medication history discrepancies between the pharmacist and physician.
2. To evaluate the types of interventions, physician follow up and therapeutic outcome of interventions made by the pharmacist in response to medication reconciliation.

Methods:
The communication tool designed for the study is a duplicate format progress note. A pharmacist will perform the medication reconciliation and make record of any pharmacotherapeutic recommendations and/or interventions made to the medical team on this progress note. All pharmacy interventions will be placed in the chart as a permanent record. Interventions, requiring immediate physician attention will also be communicated verbally. All duplicate progress notes completed during the study will be collected by the investigator. The investigator will categorize the data obtained from the forms based on type of recommendation, response and outcome. If incomplete forms are received, the investigator will review the chart within 72 hours to clarify the recommendation and response by the medical team.

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

Learning Objectives:

To identify the prevalence of medication errors directly related to patient admission, transfer and discharge.

To identify the therapeutic value of a pharmacist-directed communication tool by evaluating the types and response to the recommendations made by the pharmacist.

Self Assessment Questions:

Incomplete or inaccurate medication histories have greater potential to cause medication errors. T or F

In various studies, pharmacists obtained the most accurate and complete medication histories when compared to nurses and physicians. T or F

ADVERSE OUTCOMES ASSOCIATED WITH THE USE OF ATYPICAL ANTIPSYCHOTICS FOR THE MANAGEMENT OF BEHAVIORAL AND PSYCHOLOGICAL SIGNS AND SYMPTOMS OF DEMENTIA

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Background:
Behavioral and psychological signs and symptoms of dementia (BPSD), such as agitation, aggression, delusions, and hallucinations can be present in 60-98% of patients with dementia. Atypical antipsychotics are frequently used for this off-label indication of BPSD. However, clinical studies have shown death rates 1.6-1.7 times that of placebo. The most common causes of mortality were cardiovascular (heart failure, cardiac arrest, sudden death) and infectious cases (pneumonia). As a result of an increase in mortality observed in elderly patients with BSPD, a health advisory FDA warning for all atypical antipsychotic agents was issued. Cerebrovascular morbidity (stroke, transient ischemic attack) and mortality have also been reported in trials with elderly patients taking atypical antipsychotics, showing a significantly higher incidence of cerebrovascular adverse events compared to patients treated with placebo.

Purpose:
The purpose of this retrospective review is to determine the potential morbidity and mortality associated with the use of atypical antipsychotics in elderly patients for the treatment of BPSD at this institution.

Methods:
This study will be a retrospective, electronic chart review of patients age 65 years and older with dementia. Patients with a prescription for an atypical antipsychotic between January 1, 2003 and December 31, 2003 will be compared to a control group not receiving an atypical antipsychotic in the same time period. Patients will be excluded if they received an atypical antipsychotic for less than 2 weeks or if the agent was prescribed for an indication other than BPSD. The following data will be collected: demographics; target symptoms; hospitalizations; atypical antipsychotics used; selected laboratory values; targeted past medical history; and cause of death. The primary endpoints will be morbidity (stroke, transient ischemic attack, myocardial infarction, infection) and mortality. Secondary endpoints will include changes in lipid profile, blood glucose, and hemoglobin A1c.

Results/Conclusions:
Data collection and analysis are ongoing.

Learning Objectives:

Review the risk of morbidity and mortality associated with the use of atypical antipsychotics in elderly patients with dementia.

Identify risk factors for developing cardiovascular, cerebrovascular, and infectious morbidity and mortality in patients treated with atypical antipsychotics.

Self Assessment Questions:

True or False. There is a current FDA issued black boxed warning on all of the atypical antipsychotic agents, including the combination agent olanzapine-fluoxetine combination.

True or False. There are FDA approved agents available for the pharmacological management of BPSD.

EVALUATION OF MEPERIDINE UTILIZATION AT A TERTIARY ACADEMIC MEDICAL CENTER

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Purpose: Meperidine is an opioid that is currently still used for analgesia although there are several disadvantages to its use when compared to other analgesics. Meperidine is associated with adverse drug events due to the accumulation of the toxic metabolite normeperidine in patients who have renal dysfunction and/or are greater than 65 years of age. The accumulation of normeperidine can lead to tremors, seizures, and delirium. In response to many of these patient safety concerns, several national agencies have advocated against the use of meperidine, namely the Joint Commission on Accreditation of Healthcare Organizations, American Pain Society, and the Agency for Health Care Policy and Research. At The Ohio State University Medical Center (OSUMC), meperidine use continues in certain patient populations despite the potential for adverse effects. Currently, there is not a policy that addresses the appropriate use of meperdine and thus we continue to see inappropriate use. The purpose of this evaluation is to characterize the use of meperidine in the inpatient and outpatient population at University Hospitals, the Ross Heart Hospital and the James Cancer Hospital. Specifically, the evaluation will determine what patient population(s) receives meperidine, how physicians prescribe meperidine, the frequency of administration in patients for whom contraindications exist, and what prescribing service is responsible for the majority of meperidine orders.

Methods: Patients who received meperidine at the OSUMC from 11/01/05-11/30/05 were identified by evaluating removal data from the automated distribution cabinets (Pyxis™). Information to be collected includes: prescribing medical service, age, dose, serum creatinine, height, weight, allergies, and cumulative daily doses.

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

Learning Objectives:

To describe how meperidine is currently being utilized at the OSUMC

To look at the current national recommendations for meperidine use and compare those recommendations to the current utilization patters at OSUMC

Self Assessment Questions:

What toxic metabolite of meperidine can accumulate in patients with renal dysfunction?

What national agencies have spoken out against the use of meperidine?

DISCHARGE MEDICATION RECONCILIATION PROGRAM: IMPLEMENTATION OF A TRIPLICATE DISCHARGE ORDER FORM AND EVALUATION OF ITS IMPACT ON AMBULATORY PHARMACISTS AND INPATIENT SATISFACTION

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The purpose of this study is to determine the impact of a triplicate discharge form on ambulatory pharmacist practice and on pharmacist, nurse, and physician satisfaction with the discharge process.

The initial survey will follow prescriptions of patients enrolled in the University of Wisconsin Hospital and Clinics (UWHC) health maintenance organization, Unity. Ambulatory pharmacies that dispense a significant quantity of prescriptions to patients discharged from UWHC will be identified by matching discharge dates to drug coverage claims made within 30 days of discharge. The Pharmacy Society of Wisconsin database will then be used to contact pharmacists at these sites to be polled using an online survey and to participate in a focus group. This process will be designed to determine what information pharmacists' desire on discharge forms. Based on these results a discharge form will be developed that will serve as a patient's written prescriptions at discharge and will contain the requested additional clinical data. This new form will be printed in triplicate allowing the original to be sent to a patient's ambulatory pharmacist. Inpatient pharmacist, physician and nursing satisfaction with the discharge process will be surveyed prior to and after the form's implementation.

The results of the survey prior to the implementation of the form demonstrated that the inpatient health care team is overall neutral to dissatisfied with the current discharge form. Specifically, they perceive the form as inefficient and are only neutral in their belief that the form ensures continuity. Preliminary results also demonstrate that ambulatory pharmacist's value basic prescription information (quantity, refills, allergies, and medication allergies) and have little desire for certain clinical information (weight and creatinine clearance).

Conclusions on the impact of the form on inpatient health care team satisfaction and on the results of the focus group will be presented at the conference.

Learning Objectives:

List the potential adverse outcomes tied to a lack of continuity of care during a patient's transition from inpatient care to ambulatory care.

Describe what type of information ambulatory pharmacists' desire in written discharge related communication from inpatient pharmacists and list the potential advantages and disadvantages of a triplicate form from an inpatient and outpatient pharmacist's perspective.

Self Assessment Questions:

Lack of continuity of care from hospital discharge leads to drug related problems in over 60% of patients. T or F

According to this presentation, which of the following are ambulatory pharmacists most likely to desire on discharge prescriptions?

a. Creatinine clearance
b. Patient weight
c. Medication goals (e.g. INR 2-3)
d. Clear handwriting

EVALUATION OF A POSTSURGICAL BLOOD GLUCOSE CONTROL TEAM

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Purpose: The objective of this investigation is to evaluate the effectiveness of a newly formed Blood Glucose Control Team and developed protocols in controlling blood glucose levels 48 hours postsurgically in at risk patients. At risk patients are defined as those patients with blood glucose levels of 150mg/dl or higher preoperatively or intraoperatively.

Methods: A retrospective review of the last 60 general surgical patients with a blood glucose level greater than 150mg/dl within 24 hours of admit will be conducted using reports generated from the hospital database. The data from the retrospective review will be compared to data from the first 60 patients that will be managed by the glucose control team. Glucose control team process, data, and protocols will be reevaluated after every 20 patients up to the endpoint of 60. Changes in the protocol, workflows, or process will be considered after each group of 20 patients. The goal will be to develop an efficient, reproducible, and effective process for controlling blood glucose levels up to 48 hours postoperatively in a group of general surgical patients.
Comparisons of blood glucose control and outcomes between the retrospective and concurrent groups will be made to evaluate the effectiveness of the team and protocols in controlling patients' blood glucose levels 48 hours postoperatively.

Preliminary Results: Preliminary results are currently not available. Results to be presented include patient demographics, analysis of the number of blood glucose values within goal range, number of episodes of hypoglycemia, length of hospital stay, pharmacist time to manage each patient and protocol alterations and process assessment.

Conclusions: The evaluation of these protocols and the Blood Glucose Control Team will allow for optimization of blood glucose management among general surgical patients. Ideally, the results of this assessment will be the impetus for implementation of similar protocols and management of other surgical populations.

Learning Objectives:

Describe the effect of a blood glucose control team on blood glucose management in postoperative general surgical patients.

Identify patient characteristics that put them at risk for developing postoperative hyperglycemia.

Self Assessment Questions:

True or False: Postoperative hyperglycemia has been associated with increased risk of post-surgical infection, morbidity, and mortality.

True or False: Current data supports keeping blood glucose levels less than 150mg/dl in cardiac surgery patients.

CLINICAL AND ECONOMIC OUTCOMES OF DAPTOMYCIN FOR THE TREATMENT OF COMMUNITY-ASSOCIATED MRSA (CAMRSA) SKIN AND SOFT TISSUE INFECTIONS (SSTIS)

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Background:
The mortality rate for severe SSTIs with Staphylococcus aureus (SA) remains as high as 20 to 25 percent despite the presence of effective antimicrobial agents. The emergence of CAMRSA has heightened our awareness of the importance of this pathogen. CAMRSA has the capacity to express different virulence factors. These virulence mechanisms assist the organism to infect the host rapidly, leading to increased severity of infection and clinical presentation. Reported manifestations of CAMRSA include: septic shock, necrotizing pneumonia, and complicated SSTIs. The summation of these virulence factors working in concert facilitates the rapid spread of severe SSTIs in the community. According to the Centers for Disease Control and Prevention, the current prevalence rate of CAMRSA ranges from 8-20%. The current standard therapy for methicillin-resistant Staphylococcus aureus (MRSA) infections is vancomycin. Recently, several new antimicrobials have been studied for the treatment of SSTI including daptomycin, a lipopeptide antibiotic.

The purpose of this study is to evaluate the potential impact of treatment with daptomycin on both clinical and economic outcome of patients with CAMRSA SSTIs. This newer antimicrobial agent may decrease length of stay, decrease healthcare costs, and improve patient outcomes compared to the current standard of care.

Methodology:
This is a prospective, open-label evaluation of daptomycin therapy for complicated CAMRSA SSTIs. Daptomycin was compared to matched historical controls (in a 1:2 ratio) of patients receiving vancomycin therapy. Participants must be at least 18 years of age, able to give consent, and have known or suspected MRSA infection. Patients must not have received greater than 24 hours of any antimicrobial agent with activity against SA. Patients with known or suspected osteomyelitits, necrotizing fasciatis, gangrene, bacteremia, or endocarditis were excluded.

Results/Conclusions:
The results and conclusions of this study will be presented.

Learning Objectives:

Discuss the potential impact of treatment with daptomycin on clinical and economic outcome of patients with CAMRSA SSTIs.

Discuss the clinical and molecular epidemiology associated with CAMRSA SSTIs.

Self Assessment Questions:

T/F: CAMRSA infections can rapidly progress into bacteremia, necrotizing pneumonia, or septic shock.

T/F: The Panton-Valentine Leucociden (PVL), a cytotoxic virulence factor enables the organism to destroy leukocytes and cause severe tissue damage.

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

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Asthma is a chronic inflammatory condition of the lungs estimated to affect 5% of Americans. The focus of treatment for patients with asthma has shifted from management of clinical markers to overall disease 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). Elderly patients have been reported to be more likely to underreport the severity of their asthma. This overestimation of control and underreporting of symptoms leads to increased exacerbations and higher health care costs. Spirometry is a widely used test to estimate severity of asthma; however, there is a lack of easily administered tools to assess overall asthma control.

The asthma control test was initially validated in 471 asthma patients ranging in age from 12-94 years. The Asthma Control Test (ACT) is a brief, easily administered, patient-based questionnaire designed to assess asthma control. Our research question is whether the validity of this test translates to elderly patients treated in a Veterans Hospital setting?

Patients with asthma who meet specific criteria are enrolled at routine clinic visits. After consenting to the study, patients complete a demographic form and then complete the ACT. Spirometry is preformed on each patient. The health care provider will document the current controller medications, use of rescue inhalers, and overall global assessment after the visit. The scores from the ACT will be compared to the results of spirometry and clinical assessments.

To date 13 patients have meet study criteria and have been enrolled. Results and conclusions are pending and will be presented at the conference.

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:

Spirometry is the only tool available to measure asthma control. True/False

Identify a situation in your clinical practice where the Asthma Control Test could be used.

AN EVALUATION OF DAPTOMYCIN AND TIGECYCLINE FOR VANCOMYCIN-RESISTANT ENTEROCOCCUS (VRE)

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Background: Infections with Enterococcus faecium resistant to vancomycin have become more common. Currently at Cleveland Clinic VRE makes up approximately 10% of all enterococcal isolates. Emergence of this resistant pathogen has created challenges for physicians in regards to treatment options. Available agents for use in VRE infections include chloramphenicol, linezolid, and quinupristin/dalfopristin; however, side effect profiles may limit their use. Two newer agents include daptomycin and tigecycline, both with documented activity against vancomycin-susceptible E. faecalis. Limited data exist regarding daptomycin and tigecycline susceptibilities to E. faecium; however, both agents may be used for the treatment of this organism.

Purpose: The purpose of this study is to characterize isolates of E. faecium, evaluate the impact of inoculum effect on the in vitro activity of these antimicrobials and determine if resistance to daptomycin can be induced.

Methods: Isolates will be characterized by evaluating in vitro activity of daptomycin using broth microdilution; tigecycline using E-test, as well as confirmatory testing on linezolid, quinupristin/dalfopristin, and vancomycin with the same isolates. By varying the inoculum and performing susceptibility testing we will determine if bacterial burden has an impact on the susceptibility of these isolates. Finally, inducible resistance will be evaluated by performing serial passages.

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

Learning Objectives:

Discuss the activity of daptomycin and tigecycline.

Review the current treatment options for the treatment of vancomycin-resistant enterococcus.

Self Assessment Questions:

T/F Daptomycin has activity against vancomycin-resistant Enterococcus faecalis.

T/F Currently there are no breakpoints for resistance in regards to daptomycin's activity against Enterococcus faecium.

IMPLEMENTATION OF A PEER FEEDBACK SYSTEM

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Purpose:
Peer review reinforces accountability, teamwork and high quality performance standards. Results from past employee opinion surveys (EOS) indicated Riverside Methodist Hospital pharmacy department staff were interested in additional feedback on day to day performance. A system to facilitate anonymous collection and processing of constructive feedback from individuals working closely with one another needed to be developed. The peer feedback is intended to encourage peer accountability and individual growth; it will have no punitive effects.

Methods:
Initially a literature search was completed to locate articles related to peer feedback. Numerous brainstorming sessions occurred amongst the pharmacy leadership team to develop an optimal system design. The leadership team evaluated vendors to handle distribution, collection, data tabulation, and generation of the feedback reports. Focus groups were conducted within the department to identify the top ten skill sets to be addressed. Questions incorporating each of the ten skill sets were then written. The next phase of the project focused on organizing the department into work groups (i.e. groups of individuals that work closely with one another). Individuals would evaluate and be evaluated by others within their work group. A standardized method for randomization within the group was developed, in addition to expectations regarding the peer review process (i.e. distribution, deadlines for response etc.). Once the vendor was chosen, questions finalized, and work groups developed, usability testing occurred to identify potential deficiencies that needed addressed prior to implementation. Staff were actively involved in developing the system and regularly received communication throughout the process.

Results/Conclusions:
To be presented at the conference.

Learning Objectives:

Evaluate strategies for successful implementation of a peer feedback system.

Identify benefits and risks associated with a peer feedback system.

Self Assessment Questions:

T/F Anonymity is a key component of a peer feedback system.

T/F Dropping the lowest scores helps maintain the integrity of the system.

COMPARISON OF TRADITIONAL VERSUS INSULIN SENSITIVE TIGHT GLYCEMIC CONTROL PROTOCOLS IN PATIENTS WITH RENAL DYSFUNCTION IN THE MEDICAL AND SURGICAL CRITICAL CARE UNITS

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Background and Purpose: In 2003, Henry Ford Hospital developed an insulin infusion protocol designed to achieve a goal blood glucose range of 80-140 mg/dL. The protocol was then expanded to all intensive care units. The protocol has now evolved to maintain blood glucose ranges between 80-110 mg/dL. It is documented that patients who have renal dysfunction may accumulate insulin and may have reduced insulin requirements in comparison with patients who have normal renal function. Thus, a traditional tight glycemic insulin protocol may provide more insulin than a patient with renal dysfunction needs, which could potentially lead to hypoglycemia. Henry Ford Hospital has now implemented an 'insulin sensitive' protocol for patients with renal dysfunction. This study will evaluate the percentage of time patients on the new insulin sensitive protocol remain within the goal blood glucose range of 80-110 mg/dL in comparison with the traditional tight glycemic insulin protocol.

Methodology: The study is a randomized mixed prospective/retrospective group design in patients with renal dysfunction (Scr > 2.0) in medical and surgical intensive care units. The retrospective group will consist of patients with renal dysfunction that were on the traditional tight glycemic protocl, while the prospective group will consist of patients being treated with the insulin sensitive protocol. All glucose levels for the entire duration of time a patient is on an insulin infusion in both groups will be recorded and compared. The average percentage of time patients remain within goal range, as well as rates of hypoglycemia, will be calculated and compared between the historical control group and the prospective patient population. Planned enrollment is 100 patients in each group.

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

Learning Objectives:

Discuss the importance of glycemic control in the intensive care unit.

Demonstrate how a tight glycemic control protocol designed specifically for patients with renal dysfunction affects blood glucose goals of 80-110 mg/dL

Self Assessment Questions:

True or false. Patients whose blood glucose levels are maintained between 80-110 mg/dL have shown to have similar mortality rates compared to patients whose blood glucose levels are maintained between 180-200 mg/dL.

True or false. Insulin is excreted by the kidneys; therefore, patients with renal dysfunction may have decreased insulin requirements.

EVALUATION OF ALLERGY ALERTS IN A COMPUTERIZED PHYSICIAN ORDER ENTRY SYSTEM AND THE CONSEQUENCES AND COSTS ASSOCIATED WITH OVERRIDING ALLERGY ALERTS IN THE INPATIENT AND OUTPATIENT SETTINGS

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Computerized physician order entry (CPOE) has been recognized as an important tool in optimal health care provision that can reduce medication errors and improve patient safety. Implementation of a CPOE program that incorporates clinical decision support, i.e. appropriate dosing, drug-drug interactions, and drug allergies, allows the health care team to effectively and safely provide quality care. Allergy alerts, dose alerts, and drug interaction alerts are essential, but can create "noise" and over-alerting when inappropriately triggered. By evaluating the allergy alerts that fire, improvements can be made to CPOE programs to increase patient safety, prevent adverse drug events, and decrease costs.

The purpose of this project is to evaluate the use of allergy alerts at Evanston Northwestern Healthcare (ENH), in both the inpatient and outpatient settings to determine the consequences and costs associated with overridden alerts in a CPOE system. At ENH, allergy alerts fire in multiple places for ordering providers and verifying pharmacists. Allergy alerts fire when an order is entered, when the provider signs the order, and also when the pharmacist verifies the order.

This research is a retrospective chart review of allergy alerts that fired in the inpatient and outpatient settings between December 1, 2005 and January 30, 2006. Outcome data will be collected from the date the first overridden drug was administered through the fifth hospital day or until discharge, whichever comes first. Data collected will include allergy-drug alert fired, override information, overriding physician, verifying pharmacist and their actions, reason for override, any adverse drug events related to the overridden drug, completeness of the allergy field, and costs associated with ADEs. Exclusion criteria include alerted medications that were never administered and medications ordered as part of a desensitization protocol.

Data analysis is currently in progress. Results and conclusions will be presented at the Great Lakes Conference.

Learning Objectives:

Discuss the characteristics, similarities, and differences of overridden drug allergy alerts in the inpatient and outpatient settings.

Identify strategies to improve the allergy alerting process and reduce the costs associated with ADEs.

Self Assessment Questions:

When a clinician enters the override reason for a drug allergy alert as "patient tolerates," that clinician always goes into the allergy field to update allergies. True/False

It is essential to understand which alerts are clinically relevant when developing clinical decision support tools. True/False

NESIRITIDE INFUSIONS IN AN OUTPATIENT SETTING: EVALUATION OF PATIENT OUTCOMES DURING SERIAL INFUSIONS AND DURING THE POST INFUSION PERIOD

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Heart failure is a major public health concern with an enormous impact on the morbidity and mortality of its patients. Nesiritide, a synthetic form of human B-type natriuretic peptide, is indicated for treatment of acute, decompensated heart failure exacerbations. It has also found use in many heart failure clinics for serial outpatient infusions in symptomatic patients with chronic decompensated heart failure. However, recent publications have indicated a link between the use of nesiritide and increases in renal impairment and mortality. Due to these recent developments, many physicians no longer support the use of nesiritide in this setting, and insurance companies have stopped reimbursement for these outpatient nesiritide infusions. Therefore, many heart failure clinics have ceased the outpatient administration of nesiritide.

Purpose:
To evaluate renal function, quality of life, and number of hospitalizations among patients that received serial nesiritide infusions at the heart failure clinic at St. Charles Mercy Hospital. Comparisons will be made between the time during which patients were receiving the infusions and the time after which they were stopped.

Methods:
A retrospective chart review was performed of patients that received at least 5 nesiritide infusions from January 1, 2005 to July 1, 2005. Patients must also have had at least 5 follow-up visits after the infusions were stopped in order to be eligible for participation. Data was obtained for up to six months during both the infusion period and the post infusion period. The following data was collected from patient charts: age, weight, gender, hospital admissions, serum creatinine, BUN, baseline blood pressure, and blood pressure recordings during infusions. Patient questionnaires were used to evaluate edema, dyspnea, and fatigue both during the time in which they were receiving nesiritide and the time after which the infusions were stopped.

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

Learning Objectives:

Describe the role of nesiritide in the treatment of heart failure.

Evaluate and discuss the tolerability and clinical impact of nesiritide infusions in an outpatient setting.

Self Assessment Questions:

Recent reports linking nesiritide with increased risk of _____ have caused insurance companies to halt reimbursement for serial infusions in an outpatient setting.
a. Hepatotoxicity
b.Nephrotoxicity
c.Anaphylactic reactions

The most common adverse effect associated with nesiritide infusions is:
a. Tachycardia
b. Hypotension
c. Both a and b

EFFICACY AND SAFETY OF MEGESTROL ACETATE FOR WEIGHT LOSS IN CHILDREN WITH SOLID TUMORS

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Background: Malnutrition is very frequent in childhood cancer due to lack of appetite and absorption. Maintaining normal growth and development during treatment of solid tumors is an important issue. A patient's nutritional course may affect bone marrow suppression and the ability to tolerate aggressive chemotherapeutic treatment. Patients with solid tumors who are malnourished have a poor outcome when compared to nourished counterparts. Megestrol acetate is a synthetic progestin that is approved for cachexia in adults with cancer and human immunodeficiency virus. Even though megestrol acetate is commonly used in children there is only one published trial on the efficacy of weight gain in children with malignant solid tumors. The objectives of this study were to assess the efficacy and safety of megestrol acetate in children with solid tumors and to assess the quality of life in the treatment of weight gain in children with solid tumors.

Methods: All children with solid tumors with weight loss treated with megestrol acetate in the past twelve months at our institution were evaluated retrospectively. Demographics and baseline information were collected, along with dose and duration of megestrol acetate. Weight, height, and growth chart percentiles
were compared to baseline data for each child. When possible, a quality of life survey was conducted with the parent or caregiver to assess degree of appetite and energy status. Adverse events that occurred during megestrol acetate treatment were also recorded.

Results and Conclusions: Data collection is ongoing at this time. The conclusion of this study is pending further data collection and will be available in April 2005.

Learning Objectives:

To identify the causes and risks of cachexia in children with cancer.

To evaluate the efficacy of megestrol acetate in the treatment of cachexia in children with solid tumors.

Self Assessment Questions:

True or False: The mechanism of cachexia in children with cancer is well understood.

True or False: Megestrol acetate is the only FDA-approved treatment of cancer-related cachexia syndrome.

EXPANSION OF A COMMUNITY PHARMACY VACCINATION PROGRAM TO INCREASE PNEUMOCOCCAL VACCINE ADMINISTRATION IN HIGH-RISK AND ELDERLY PATIENTS

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Purpose: To (1) Utilize community pharmacists to increase pneumococcal vaccination (PPV) in high-risk and elderly patients to help approach Healthy People 2010 targets, (2) Evaluate effectiveness of a marketing program to increase PPV vaccination, and (3) Determine profitability of the program and the most cost-effective method of promotion.

Methods: Pharmacist administered vaccines are being provided at three independent pharmacies in Kentucky. A marketing program was implemented to increase PPV administration in high-risk and elderly patients. Program includes: patient mailers, print media, and provision of verbal information by pharmacists. Prescription profiles were utilized to send mailers to patients identified as high-risk. Print media includes bag stuffers attached to all dispensed prescriptions, brochures and posters displayed in the pharmacies, and advertisement space in a local newspaper. After PPV administration patients are asked to complete a short survey.

Evaluation: Data collection started in December, after IRB approval was obtained, and is currently ongoing. Data includes number of patients vaccinated with PPV and patient survey responses. Increase in pneumococcal vaccination will be evaluated by documenting number of patients vaccinated. Survey responses will be utilized to determine if patients would have received vaccination if it were not offered by the pharmacies. To evaluate effectiveness of promotional strategies, survey responses will be utilized to determine which method of promotion resulted in the most vaccinations. To determine program profitability, overall reimbursement received will be compared with administration and promotional costs. The most cost-effective method of increasing PPV vaccination will be identified by profit margin calculation for each promotional strategy.

Learning Objectives:

Determine effectiveness of pneumococcal vaccine promotional methods.

Evaluate profitability of a community pharmacy pneumococcal vaccination program.

Self Assessment Questions:

Which of the following promotional methods lead to the greatest number of vaccinations?
a. Bag stuffer
b. Newspaper advertisement
c. Patient mailer
d. Verbal pharmacist recommendation

True or False. Medicare part B provides reimbursement for pharmacist administered pneumococcal vaccinations.

PILOT OF AN INTERDISCIPLINARY ANTIBIOTIC STEWARDSHIP TEAM IN A 500 BED COMMUNITY TEACHING HOSPITAL

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Objectives: Antibiotic stewardship programs have been shown to improve patient outcomes and decrease treatment-related costs, and may slow the development of antimicrobial resistance. The objective of this project is to pilot an interdisciplinary antibiotic stewardship team to identify opportunities for intervention, and estimate return on investment.

Methodology: The pilot antibiotics stewardship team consisted of a clinical pharmacist, an infectious disease physician, and a pharmacy practice resident. Over a period of four and one half weeks beginning October 31, 2005, patients receiving two or more parenteral anti-infective agents without an infectious diseases consultation were identified using the electronic medical record. Patients 18 years or younger were excluded from the pilot. The clinical pharmacist and pharmacy practice resident evaluated each patient's antibiotic therapy, then discussed patients with the infectious diseases physician as necessary. Team recommendations were communicated to the appropriate clinical pharmacy team or directly to the prescribing physician. Estimates of medication cost savings and personnel expenses were evaluated to estimate overall pharmacy costs for the team.

Results: Eighty-seven patients were evaluated by the pilot team, resulting in eleven recommendations. Ten of the team's recommendations were accepted and implemented. The medication cost savings were estimated at (-$148.14) to $898.17. The average pharmacy personnel time was 2.6 hours per day with a total estimated personnel expense of $3420. The estimated expense of the pilot was $2521.83-$3568.14.

Conclusions: The personnel time investment relative to the medication cost savings does not favor justification through cost neutrality. The pilot team produced fewer interventions than expected; this finding may have been affected by the choice of screening criteria, physician prescribing patterns, timeliness of infectious diseases consultation, and the established presence of seven decentralized pharmacy teams throughout the hospital.

Learning Objectives:

Identify the potential benefits of antibiotics stewardship programs in the hospital setting.

Discuss the role of an antibiotics stewardship team in improving antibiotic utilization.

Self Assessment Questions:

List two goals of antibiotic stewardship programs.

True/False: Based on the results of this pilot, an antibiotics stewardship team could be justified on the basis of medication cost savings alone.

EVALUATION OF SEDATION AND ANALGESIA IN THE TREATMENT OF PEDIATRIC FRACTURES AND DISLOCATIONS IN THE EMERGENCY DEPARTMENT

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Purpose:
The emergency department (ED) physician has various medication options for procedural sedation and analgesia (PSA) management; however, the optimal PSA agents have not been determined for the treatment of pediatric fractures and dislocations. The objective of this study is to evaluate the current treatment(s) utilized in the ED for PSA in pediatric patients who present with fractures or dislocations.

Methods:
A convenience sample of pediatric patients (5 - 17 years) with fractures or dislocations was identified by the ED pharmacist between December 2005 and March 2006. Exclusion criteria consisted of patients with a documented allergy to medications used for PSA, altered mental status, no parent/guardian present, and those who were non-English speaking. After all orthopedic procedures were complete, the ED pharmacist informed the physician of patient eligibility for inclusion in this evaluation. The parent/guardian was approached about participation in the study and, if they agreed to participate, a data collection sheet was started. Data collection included timing, demographics and medication selection. All parents/guardians and patients completed a satisfaction survey prior to discharge.

Results:
Based on preliminary results of 6 patients, median time intervals equaled: length of stay, 257 minutes (range, 173 – 311 minutes); wait time, 2 minutes (range, 0 – 12 minutes); and time to physician screening, 24 minutes (range, 1 – 67 minutes). Average age was 11.17 years (range, 6 – 15 years) and all patients presented with a fracture. Five of six patients received ketamine, the sixth patient received etomidate. Three of the six patients received an intravenous analgesic. In the ketamine group, one patient received morphine and another fentanyl. The one patient in the etomidate group received morphine. Two adverse reactions were reported, nausea and rash. All procedures were successful.

Conclusion:
Final results and conclusion will be presented at Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Compare the different agents used for pain and sedation in the pediatric emergency department.

Identify potential areas that can affect parental and patient satisfaction.

Self Assessment Questions:

True or False Pain is appropriately addressed and managed in pediatric patients.

True or False Ketamine has sedative and analgesic properties.

THE PHARMACIST'S ROLE IN MEDICATION RECONCILIATION PROCESS IN A PEDIATRIC ACUTE CARE SETTING

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Objective:
A 2005 National Patient Safety Goal is to “accurately and completely reconcile medications across the continuum of care”.
The Joint Commission on Accreditation of Healthcare Organizations requires that all institutions comply with that goal starting January 2006. Nationwide, institutions are in the process of implementing “proper process” to comply with JCAHO requirements to ensure patient's safety and continuity of care.
Studies have shown that pharmacist involvement in medication reconciliation decreases the number of errors upon admission and discharge. Currently, in our institution, pharmacists clarify medication reconciliation issues after the inpatient orders are submitted. The aim of this project is to present the significance of including pharmacists proactively in medication reconciliation process.

Methods:
Accurate and complete medication history was obtained by a pharmacist for randomly selected patients who have been admitted to the Intermediate Intensive Care Unit at Children's Hospital of Wisconsin. The pharmacist evaluated 2 home medication lists: one performed by a medical resident and the other performed by a nurse. After reviewing both lists and active orders, the pharmacist checked/verified with patient/parents/caregivers and home pharmacy if the following have been ordered correctly: medication name, dosage form/concentration, dose, frequency, route of administration, indication, and length of therapy.
Outcome measurements include: number of discrepancies among active orders, number of discrepancies among home medication lists written by medical residents and nurses, number of pharmacist interventions.

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

Learning Objectives:

Identify the benefit of pharmacist involvement in medication reconciliation upon admission.

Describe the importance of one accurate home medication history list versus multiple lists.

Self Assessment Questions:

True or False: The proactive role of pharmacist in medication reconciliation process prevents errors from occurrence.

True or False: Pharmacists are especially suited to obtain medication histories and perform reconciliation based on their education, experience, medication knowledge and patient counseling skills.

ANTIMICROBIAL STEWARDSHIP PROGRAM'S IMPACT ON OUTCOMES

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Objective: Antibiotic use is frequent in hospitalized patients and when used inappropriately may be associated with emergence of resistant bacteria, prolonged hospital stays, increased morbidity and mortality and increased health care costs. The primary objective of this study is to determine if the implementation of an antimicrobial stewardship team will affect the outcomes of patients receiving antimicrobial therapy. The secondary objective is to evaluate any financial impact resulting from decreased length of stay, unnecessary broad spectrum antibiotic use, and IV to PO conversion.

Methodology: An antimicrobial stewardship team, consisting of a pharmacist and an infectious disease physician, will review therapies of high-risk infectious disease patients. The high-risk patients will include those patients receiving broad spectrum antibiotics (including imipenem/cilastatin, meropenem, ertapenem, levofloxacin, and piperacillin/tazobactam), having resistant organisms (vancomycin-resistant entercocci, methicillin resistant staphylococcus aureus, and extended-spectrum beta lactamases), or receiving more than two antimicrobial agents. Patients on single or double antibiotic coverage, pre-op antibiotics, and those from labor and delivery or the neonatal intensive care units will be excluded from this study. The high-risk patients will be reviewed to determine the reason for antimicrobial initiation and clinical appropriateness of therapy. In this study 332 high-risk patients will be randomized to either the intervention or non-intervention group. Data from patients randomized to the intervention group will be reviewed by the antimicrobial stewardship team to evaluate appropriateness of therapy. Those patients with inappropriate antibiotics will have recommendations suggested to the patient's physician. Outcomes measurements will include acceptation rate of recommendation, clinical improvement, savings per intervention, length of stay and re-admission rate.

Results: Data collection is currently in progress with the final results to be presented at the Great Lakes Residency Conference.

Learning Objectives:

Understand how an antimicrobial stewardship program can be incorporated into clinical practice and improve clinical outcomes.

Evaluate data for trends in prescribing of antimicrobials which may show divergence from current practice recommendations.

Self Assessment Questions:

True or False: Of the hospitalized patients receiving antimicrobial agents 63% of their use may be suboptimal.

True or False: Less than 50% acceptance rates have been associated with Antimicrobial Stewardship Team's recommendations.

A RETROSPECTIVE REVIEW OF THE INCIDENCE AND CORRELATING RISK FACTORS OF RENAL INSUFFICIENCY ASSOCIATED WITH THE USE OF IVIG IN AN ACADEMIC MEDICAL CENTER

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Background: Immunoglobulin (IVIg) has been used in the treatment of primary and secondary immunodeficiencies since 1952. Since the 1980s, however, the use of IVIg has increased significantly, predominantly for non-FDA approved indications. Adverse reactions caused by IVIg therapy occur in almost 15% of infusions. One of the most serious adverse reactions of IVIg is acute renal failure (ARF). In 1998, the FDA released a statement elucidating the potential harm associated with use of IVIg and a resultant “black box” warning was issued. Barton et al first reported IVIG-associated ARF in 1987. Since that initial report, 83 cases of ARF in the US have been linked to use of IVIg, with an additional 114 cases worldwide. Given the historical issues associated with use, the increasing product use and a renewed emphasis on the risks of IVIg in the current medical literature, a review of IVIg was imperative. The objective of this study is to identify the incidence and the correlated risk factors of IVIg associated renal insufficiency at an academic medical center.
Methodology: Prior to commencement, this retrospective review will be submitted to the IRB. The health-system's pharmacy information system will be used to identify patients who, over the 24-month period between March 2002- 2003 and March 2004- 2005, received IVIg. Approximately 240 patients will be included. From the medical record, demographic and clinical information, including admitting diagnosis, IVIg indication for use, past medical history related to renal insufficiency, laboratory values, and patient outcomes, will be recorded. The incidence of renal insufficiency will be calculated and patient demographics will be examined to identify specific risk factors associated with renal insufficiency. Data will be recorded without patient identifiers and confidentiality will be maintained. Data collected will be used in developing a prospective health-system-wide medication use evaluation designed to modifying prescribing criteria

Learning Objectives:

Evaluate the incidence of IVIg associated renal insufficiency in an academic medical center

Identify risk factors associated with an increased incidence of IVIg associated renal insufficiency

Self Assessment Questions:

A high concentration of osmotic substances in the final product is thought to increase the incidence of IVIg associated renal failure T or F

Renal insufficiency is the most common adverse effect associated with IVIg therapy T or F

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

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Background:
The use of prednisone as a short-term treatment for PTSD symptoms is based upon physiologic abnormalities identified in these patients. In general, PTSD patients have hypocortisolemia and increased glucocorticoid receptor levels. It is likely that prednisone will help normalize the HPA axis and may reduce symptoms of PTSD. The hypothesis of this study is that a two week course of 20mg/day of prednisone will result in a significant improvement on the clinician-administered PTSD scale (CAPS) than placebo.

Methods:
This is a 14-day, prospective, randomized, double-blind, placebo-controlled trial of prednisone for the treatment of PTSD symptoms. Potential study participants will be identified by their primary mental health providers, and subjects will be enrolled after screening for exclusion criteria. Dexamethasone suppression tests (DST) will be done at baseline, week 6, and week 12 to determine subjects' baseline cortisol production. Salivary cortisol levels will be obtained at 0800, 1200, and1600 prior to the DST as well as 0800 after the DST. Researchers will assess study participants' PTSD symptoms at baseline, week 2, week 6, and week 12 using the CAPS, 17-item Hamilton Depression Scale, (HAM-D), Clinical Global Impressions Severity Scale (CGI-S), Treatment Outcome PTSD Scale (TOP-8), and PTSD-PCL. Weight, blood pressure, heart rate, DHEA-S and Chem 7 will also be assessed at baseline, week 2, week 6, and week 12. Subjects will be telephoned on day 7 and 21 of study drug administration to ensure safety and inquire about side effects using the systemic assessment for the treatment emergent events (SAFTEE-GI). Lastly, subjects will complete the self-rated PTSD-PCL at weeks 0, 1, 2, 3, 6, 12. This is done to assess any change in PTSD symptomology before, during and after study drug administration.

Results/Conclusions:
Study enrollment and initial data is ongoing. Preliminary results and conclusions will be presented.

Learning Objectives:

Discuss the prevalence of PTSD in the veteran population and identify the core symptoms of PTSD.

Describe the mechanism by which prednisone may help with PTSD symptoms.

Self Assessment Questions:

In general, PTSD patients have higher levels of cortisol than patients with depression. T/F

The highest cortisol levels in the human body occur at midnight. T/F

STANDARDIZATION OF OB PRESCRIBING AT A SATELLITE CAMPUS IMPROVES MEDICATION TURN AROUND TIME, DECREASES COST, AND IMPROVES SATISFACTION WITH PHARMACY SERVICES.

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Background
Mercy General Health Partners consists of a main campus with 24-hour pharmacy services and a satellite campus consisting of inpatient rehabilitation and labor and delivery units. On off-shifts, medications are transported to this satellite campus by either courier or taxi, which is both time consuming, expensive, and disliked by nursing staff.
As standard procedure, mothers at risk for transmitting Group B Streptococcus receive prophylactic gentamicin and ampicillin to prevent transmission and neonatal sepsis. Change in our knowledge of the pharmacokinetics and pharmacodynamics of aminoglycosides has warranted a reassessment of dosing protocols in this area.

Purpose
To develop a process that administers antibiotics to mothers at a satellite campus at appropriate doses in a timely manner.

Methods:
An initial survey of OB nursing staff was conducted to assess hurdles in the medication dispensing process. A database was concurrently created which assessed if pregnant females could receive gentamicin 80 mg every 8 hours and obtain therapeutic levels of 3-5 mcg/ml. A retrospective chart review was conducted on all mothers that received ampicillin and gentamicin from January 1, 2005 – January 1, 2006. The primary objectives of the chart review were to analyze what dose these patients received and whether the dose of gentamicin 80 mg every 8 hours would obtain therapeutic levels in this patient population.
A follow-up survey of the OB nursing staff will be conducted to assess whether the standardized dose has improved medication turn around time and improved satisfaction with pharmacy services.
Costs of taxi fare were collected for the three months prior to and after implementation of the project. These costs will be annualized to see the yearly impact of this change.

Results pending upon completion of data collection.

Learning Objectives:

Describe the hurdles of having a satellite hospital campus.

Describe the advantages of having standardized dosing gentamicin protocol for pregnant females.

Self Assessment Questions:

T/F A satellite campus is a hurdle to achieving good pharmaceutical care.

A standardized gentamicin dosing protocol will
a. Improve pharmaceutical care
b. Improve medication turn around time
c. Save money
d. All of the above

ADVERSE SEROTONERGIC EFFECTS OBSERVED IN PATIENTS RECEIVING CONCOMITANT LINEZOLID AND SEROTONIN REUPTAKE INHIBITORS

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Purpose: Linezolid, an oxazolidinone antibiotic, has been shown to be a reversible, non-selective inhibitor of monoamine oxidase, and as such has the potential to interaction with medications that inhibit serotonin reuptake. Several published case reports have described clinically significant symptoms of serotonin excess (e.g., tremor, agitation, myoclonus) in patients taking linezolid and serotonin reuptake inhibitors (SRIs) concomitantly. The objective of our research is to determine if the concomitant use of linezolid and one or more SRIs is associated with an increase in adverse effects that are consistent with serotonin excess. Secondary outcomes include incidence of serotonin syndrome, severity of serotonin syndrome, number of adverse effects consistent with serotonin syndrome observed, the incidence of medication discontinuation due to adverse effects, length of stay (ICU and hospital), and mortality.

Methods: We are conducting a retrospective, case-control study of inpatients at the University of Michigan Medical Center. Using the electronic databases, we will identify all patients who received linezolid and one or more SRIs concomitantly for at least 24 hours between January 1, 2000 and December 30, 2005. Cases will be matched to control patients who received one or more SRI along with any antibiotic(s) other than linezolid for a similar infectious process over the same time period. The cases and controls will be matched for age (by decade), gender, race, hospital service (medical vs. surgical), and which SRI(s) the patients were receiving. All components of the medical record will be reviewed to evaluate for the presence of documentation of symptoms consistent with serotonin excess (e.g., tremor, agitation, myoclonus, delirium, hyperreflexia, tachycardia), serotonin syndrome, and other relevant data. A standardized data collection form will be used, and data will be entered into a secure database for analysis.

Results/Conclusions: Data collection in progress; conclusions will be drawn based on the analysis of the data.

Learning Objectives:

Describe the mechanism of the interaction between linezolid and serotonin reuptake inhibitors.

Identify risk factors for development of symptoms of serotonergic excess in patients taking linezolid and a serotonin reuptake inhibitor concomitantly.

Self Assessment Questions:

Linezolid contributes to symptoms of serotonergic excess by enhancing the pre-synaptic synthesis of serotonin from chemical precursors. T or F

Patients should never be prescribed linezolid and a serotonin reuptake inhibitor concomitantly. T or F

IMPLEMENTATION OF A PHOSPHORUS REPLACEMENT PROTOCOL IN THE CRITICALLY ILL

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PURPOSE: To evaluate the efficacy and safety of a weight-based phosphorus replacement protocol in adult intensive care unit patients through assessment of serum phosphorus levels.

METHODS: This investigation is a retrospective and concurrent review of patient records. Adult intensive care unit (ICU) patients, identified by computerized reports, will be included based on phosphorus levels and administration of intravenous (IV) phosphate prior to and after implementation of a weight-based replacement protocol (control patients versus protocol patients, respectively). Patients will be excluded for age less than 18 years, weight below 40 kg or above 120 kg, pregnancy, diabetic ketoacidosis, hemodialysis, renal insufficiency as evidenced by creatinine clearance below 30 mL/min or serum creatinine above 2 mg/dL, urine output below 30 mL/hr two hours prior to phosphorus administration, hypercalcemia, or hypernatremia. Data collection, which will be compiled in Excel format, will include demographic information; amount, volume, and type of line for phosphate doses administered; and laboratory data, including phosphorus levels, sodium, potassium, calcium, BUN, and creatinine. Additional collected data will include amount of phosphate per day in total parenteral nutrition (TPN) and/or tube feedings, co-morbidities, reason for hypophosphatemia, and contraindications to protocol initiation if applicable. The primary endpoint of efficacy comparing control and protocol patients will be assessed by normal serum phosphorus levels (2.3 to 4.9 mg/dL) at least 12 hours after IV phosphate administration. Secondary endpoints include number and amount of phosphate doses required, number of phosphorus levels taken, and ICU length of stay. Safety will be evaluated by identifying adverse events related to phosphate administration.

RESULTS/CONCLUSION: Adult control patients from five intensive care units (surgical ICU, medical ICU, coronary recovery unit, coronary ICU, and neuro ICU) have been identified for evaluation to be compared to patients who will receive IV phosphate based on a pre-defined protocol.

Learning Objectives:

To identify the impact of hypophosphatemia on critically ill intensive care unit patients.

To evaluate the efficacy of phosphate replacement with and without a defined protocol in intensive care unit patients.

Self Assessment Questions:

Which of the following may result from uncorrected hypophosphatemia in intensive care unit patients:
a. Platelet dysfunction
b. Neurological deficits
c. Difficulty weaning from the ventilator
d. All of the above

What patients would be of concern when initiating phosphorus repletion?

IMPLEMENTATION OF A EDUCATIONAL PROGRAM SERIES

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New medications, protocols, and guidelines are released at such a rapid rate, it seems as though we are out of date, as soon as something new hits the pipeline. By creating a new educational presentation series “Let's Talk About” at MidMichigan Medical Center-Midland, the goal is to decrease the lag time on information that is available to the nursing staff. The “Let's Talk About” presenter, either the pharmacy resident or pharmacy students led by the resident, travel throughout the nursing stations offering short presentations with topics on new drug information, protocols, or guideline updates. Presentations rely on student and pharmacy resident involvement to be successful. The purpose of this project is to develop an educational tool that can be used by pharmacists, nurses, residents, and pharmacy students alike to provide information and increase the quality of care our patients receive.

This is an ongoing project that will have presentations at least one time per month. Recommendations on how to improve this service will be collected through the use of post-presentation surveys distributed to those who attend. Future topics will also be developed from these surveys.

Information on starting an educational program, feedback, and conclusions will be presented.

Learning Objectives:

To describe the process of developing and implementing a presentation series educational program.

To identify challenges involved in creating an educational program.

Self Assessment Questions:

Developing an educational program is a one-person job. T F

List two challenges that may occur when starting an educational program.

A NATIONAL SURVEY OF RETAIL PHARMACISTS TO DETERMINE KNOWLEDGE, ATTITUDES, AND PRACTICES REGARDING TRAVEL HEALTH INFORMATION AND IMMUNIZATION SERVICES

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Purpose: Community pharmacists can play a vital role in preparing travelers with education, vaccinations, and resources to assist in prevention of illness. The primary objective of this study was to assess the knowledge, attitudes, and behaviors of pharmacists regarding the provision of travel health information and immunizations. A secondary objective compared responses from trained immunizing pharmacists versus untrained non-immunizing pharmacists.
Methods: This national survey of 863 immunizing and 863 non-immunizing pharmacists employed by a chain pharmacy (n=1726) will be distributed electronically using a modified Dillman method. The responses will provide a measure of current knowledge of travel health information, attitudes on providing travel-health education, and extent of services offered. Responses will be scored within each domain (behaviors, attitudes, barriers, and knowledge) using a 5-point Likert scale. Based on the participant's response, a summed score will be calculated within each domain. Domain scores will vary according to the number of questions in each domain. Descriptive statistics and cross-tabulations will be used to describe respondents' demographics, attitudes, knowledge, barriers and behaviors. Domain scores from trained immunizing pharmacists will be compared to untrained non-immunizing pharmacists using a students' t-test. A linear regression model will be constructed using behavior domain scores as the dependant variable and factors associated with immunizing behaviors from survey responses as independent variables.
Results: Data collection is ongoing. Results will be presented at the Great Lakes Pharmacy Resident Conference.
Conclusion: The results will provide a baseline measure of pharmacists' knowledge and perceived obstacles to providing travel information and immunization services. In addition, the regression model may identify those factors most strongly associated with the provision of travel-related immunization services by pharmacists. These data could facilitate the development of educational and training materials for future clinical programs.

Learning Objectives:

Understand the need for traveler education and immunization services.

Determine the role of pharmacists in providing traveler education and immunization services.

Self Assessment Questions:

People traveling to international destinations need consultations to prepare them for their trips which include destination information, medical contact information, and required immunizations. T or F

Pharmacists are one of the least accessible health care professionals and thus should not be providers of travel immunization services. T or F

WEEKLY DOSING OF ATORVASTATIN: IS EFFICACY MAINTAINED?

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PURPOSE: Addition of pharmacologic agents to lifestyle modification is increasingly required for many patients to meet the cholesterol goals set forth by the National Cholesterol Education Program Adult Treatment Panel III Guidelines. Hydroxymethylglutaryl coenzyme A (HMG-CoA) inhibitors are the most commonly prescribed and most costly medications for cholesterol management. The purpose of this study is to investigate whether once weekly dosing of atorvastatin 80mg is as efficacious at maintaining current LDL levels as daily dosing with atorvastatin 10mg or its equivalent.

Because of its long duration of action, good safety profile, and estimated 40% reduction in LDL, atorvastatin is often chosen as a first line agent. Atorvastatin has active metabolites with estimated half-lives of 11-57 hours.1-2 Because of this pharmacokinetic property, atorvastatin may maintain similar LDL reductions when dosed at less frequent intervals.

If once weekly atorvastatin proves to be effective it may not only provide increased convenience and compliance, but a substantial cost savings to the patient as well.

METHODS: Patients who are currently at NCEP goal LDL levels on daily atorvastatin 10mg, simvastatin 20mg, pravastatin 40mg, lovastatin 80mg, or fluvastatin 80mg will receive atorvastatin 80mg weekly for 6 weeks. Baseline and end of study ALT and fasting lipid panels will be performed. A bi-weekly phone survey will be conducted to assess compliance and adverse events. Participants will be instructed not to change their dietary or exercise habits, and the weight of each patient will be recorded at the beginning and end of the study.

PRELIMINARY RESULTS AND CONCLUSIONS: Patients are currenly being enrolled in the study at this time. Results are pending.

Learning Objectives:

Explain why atorvastatin may be effective when dosed once weekly.

List the proposed advantages of dosing atorvastatin weekly versus daily.

Self Assessment Questions:

What is the expected reduction in LDL for a patient taking Lipitor 10mg daily?
A. 20%
B. 30%
C. 40%
D. 50%

Dosing of atorvastatin at less frequent intervals may be possible due to
A. long half-lives of its active metabolites.
B. increased bioavailability.
C. lower NCEP goals.
D. its concomitant administration with grapefruit juice.

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

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A number of recent studies have outlined the benefits of euglycemia in the critically ill demonstrating positive overall benefit in morbidity and mortality related to the institution of intensive insulin therapy protocols. The benefits of reducing glucose concentrations on overall morbidity and mortality in the total ICU population have been staggering, but whether or not the same results pertain to all subpopulations within the ICU is unknown. The purpose of this study is to evaluate the efficacy of current insulin use in the trauma patient population and its effects on measured outcomes.

This is the second of a two-part study examining the effects of hyperglycemia in the trauma patient population. Phase I consisted of a baseline retrospective review of glucose management in trauma patients. Phase II is a retrospective review examining the effects of hyperglycemia in the trauma patient population following the institution of a strict hyperglycemia management protocol. Goal glucose concentrations were set at 80-110 mg/dl. Patients exceeding goal glucose concentrations were treated utilizing insulin (sliding scale and/or long acting) or an insulin infusion protocol. Trauma patients were included if they were ³ 18 years old and admitted to an adult intensive care unit for ³ 48 hours. Data was collected on days 1-5 of hospitalization.

In phase I of this study, trauma patients admitted to the ICU, as expected, show marked hyperglycemia on day one, but throughout the course of the first five days of admission, hyperglycemia decreased toward glucose homeostasis. Average glucose concentrations ranged from 154±45 on day one to 132±34 mg/dl on day five. One-third of the phase I patients admitted to the ICU received insulin in the first five days of treatment. Of the 33% of trauma patients treated with insulin, 83% were prescribed a sliding scale with a resultant overall average glucose concentration of 143±40 mg/dl.

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?

What is an appropriate is an appropriate endpoint for glucose management?

MEDICATION RECONCILIATION: REDEFINING THE CLINICAL PHARMACIST'S ROLE IN PATIENT SAFETY

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One of the Joint Commission on Accreditation of Healthcare Organization's (JCAHO) 2006 National Patient Safety Goals is “to accurately and completely reconcile medications across the continuum of care.” The purpose of this study is to evaluate the efficacy of a medication reconciliation process that utilizes pharmacists to obtain medication histories for all patients upon admission. The process will be implemented by January 1, 2006 in accordance with JCAHO. Efficacy will be determined by two measurements: the satisfaction of health care providers with the medication reconciliation process and the hypothesized reduction in the number of unreconciled medications per 100 admissions.

A web-based, anonymous survey tool was utilized to rate the satisfaction of nurses and pharmacists with the former process of nurses obtaining home medication lists upon a patient's admission to the hospital. Baseline results from this survey indicate over ninety-five percent of pharmacists and nurses believe at least some process improvement is needed. The same population will be surveyed after the new pharmacist medication reconciliation process upon admission has been implemented in January 2006. The investigators hypothesize that an improvement in health care provider satisfaction will occur with the implementation of a pharmacist obtaining an accurate and complete home medication history. In addition to satisfaction, a retrospective chart review will be performed in order to collect the number of unreconciled medications per 100 admissions and the percent of unreconciled medications. The data will be compared to internal baseline data prior to the improved process and published results from other institutions nationally to determine the efficacy of pharmacists in obtaining a complete and accurate home medication list to prevent medication errors.

The results and conclusions of this study will be presented and used to further standardize and optimize the medication reconciliation process with the goal of eliminating potential serious medication errors.

Learning Objectives:

Define the role of medication reconciliation in patient safety

Describe how pharmacists can be utilized to prevent medication errors

Self Assessment Questions:

What is the purpose of medication reconciliation?

What are two measurements used to show improvement in a medication reconciliation process?

USE OF LEVETIRACETAM AS AN ANTIEPILEPTIC AGENT IN THE INTENSIVE CARE UNIT

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Purpose: Currently, the use of levetiracetam in the intensive care unit (ICU) has not been described. Phenytoin, the standard antiepileptic drug (AED) has numerous challenges in relation to dosing, administration, and adverse effects. Levetiracetam, a newer antiepileptic agent has a limited side effect profile, does not affect the cytochrome P450 pathway, and does not require serum concentrations to be drawn. This retrospective review will look at the use of levetiracetam in the ICU patient population at the University of Illinois Medical Center at Chicago (UIMCC) to date.

The primary objective is to determine if levetiracetam is effective in preventing and/or treating seizures clinically and per electroencephalogram (EEG). The secondary objectives are to determine the safety and tolerability of levetiracetam, the reasons for initiating levetiracetam, and the usage pattern of levetiracetam in the ICUs at UIMCC.

Methods: This study will be conducted as a retrospective chart review of patients who received levetiracetam while in the ICU. Patients will be included in this study if they are administered levetiracetam during January 2002 through October 2005. Exclusion criteria will include patients < 18 years of age, pregnant females, and patients not admitted to an ICU. Data that will be collected includes patient demographics, renal and liver function, EEG results, observed seizures in daily progress notes, dose of levetiracetam started, final dose of levetiracetam, rate of titration of dose, reason levetiracetam started, other AEDs patients receiving previously, concurrently, or after levetiracetam, average serum concentrations of other AEDs drawn, pertinent labs, adverse events including rash and unexplained fever, and any serum levetiracetam concentrations drawn. Patients will be followed until levetiracetam is discontinued, patient is discharged from the hospital, or death occurs.

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

Learning Objectives:

List situations where an antiepileptic agent is used in an intensive care unit.

Compare and contrast the adverse effects associated with traditional antiepileptic agents (phenytoin, valproic acid, and carbamazepine) and levetiracetam

Self Assessment Questions:

Prophylactic antiepileptic agents are used in the intensive care unit for all of the following indications except:
a. Skull depression
b. Subarrachnoid hemorrhage
c. Status post craniotomy
d. Sepsis

Common adverse effects of levetiracetam include:
a. Rash
b. Nystagmus
c. Somnolence
d. QTc prolongation

EVALUATION OF RENAL FUNCTION IN HIV-INFECTED PATIENTS USING THE MODIFICATION OF DIET IN RENAL DISEASE (MDRD) VERSUS COCKROFT-GAULT (CG) EQUATIONS: EFFECT ON DOSAGE ADJUSTMENT OF TENOFOVIR.

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Background: Recent estimates suggest that 30% of HIV-infected patients have abnormal renal function. Tenofovir disoproxil fumarate (TDF), a nucleotide reverse transcriptase inhibitor commonly used as part of HIV therapy, has been associated with renal toxicity and must be dosed appropriately to ensure safety and efficacy. Equations such as CG and MDRD are often used to estimate glomerular filtration rate (GFR) for purposes of dosing medications. Although not yet validated in the HIV-infected population, there is speculation that the MDRD equation may provide a more accurate estimate of renal function.

Methods: This retrospective observational study includes all patients enrolled in the Northwestern Memorial Hospital (NMH) HIV Outpatient Study (HOPS) who have received at least one dose of TDF. The primary endpoint evaluates whether using modified MDRD versus CG would result in more frequent dosage adjustments of TDF. FDA-approved package labeling recommends adjusting the TDF dose at a creatinine clearance <50ml/min. Subgroup analysis will be performed based on race, gender, age, and CD4+ cell count. Continuous variables will be evaluated using paired sample t-test and binary variables will be evaluated using the McNemar's test for paired samples. The study hypothesizes that estimation of renal function in HIV-infected patients using modified MDRD will increase the number of patients in whom TDF dose adjustments are required.

Results: The study identified 110 patients in the NMH HOPS database who have received at least one dose of TDF since its FDA approval in November 2001. Data analysis is currently on-going and final results will be presented at the conference.

Conclusion: The present study addresses the potential clinical implications of using either the modified MDRD or CG equations, specifically in reference to dosage adjustment of TDF for which inappropriate dosing has been associated with worsening renal function in HIV-infected patients.

Learning Objectives:

Differentiate between the Cockroft-Gault (CG) and Modification of Diet in Renal Disease (MDRD) equations used for estimation of glomerular filtration rate.

Discuss the various mechanisms of abnormal renal function in HIV-infected patients including any antiretroviral agents that may be associated with renal toxicity.

Self Assessment Questions:

List two variables evaluated in the modified MDRD equation that are not included in the CG equation.

TRUE or FALSE: Tenofovir does not need to be adjusted in patients with renal insufficiency.

EVALUATION OF OUTCOMES FOR A PHARMACIST-RUN SMOKING CESSATION PROGRAM

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Purpose:
Smoking cessation services using pharmacotherapy and/or individualized counseling are currently provided by The University Hospital Pharmacotherapy Clinic. We plan to evaluate the efficacy of these smoking cessation services on decreasing nicotine dependence and improving health parameters including heart rate, blood pressure, FEV1 and weight.

Methods:
All patients of The University Hospital Internal Medicine Clinics are eligible for this study. Patients can be referred to the clinic by their primary care physicians or other healthcare providers. Under a consult agreement with the patient's physician, a pharmacist provides smoking cessation services combining pharmacotherapy with individualized counseling. The patients attend at least five visits consisting of behavior modification tools and counseling, assessment of nicotine dependence, and development of a quit date and plan. Health parameters including heart rate, blood pressure, FEV1 and weight are evaluated at each visit. Patients also complete questionnaires on days 0, 30 and 60 evaluating their experience at the clinic as well as cessation. The data from these visits is being collected to evaluate the effectiveness of the program on decreasing nicotine dependence as well as improvement of specific health parameters.

Conclusions:
As of January 17th, 19 patients are currently enrolled in the study.

Learning Objectives:

Discuss the health effects of smoking.

Describe behavior modification tools and pharmacotherapy to aid in smoking cessation.

Self Assessment Questions:

Blood pressure is not affected by nicotine. True or False

Blood pressure is not affected by nicotine. True or False

ANALYSIS OF COMPUTERIZED PRESCRIBER ORDER ENTRY SYSTEMS IN THE PEDIATRIC SETTING: THE PHARMACY PERSPECTIVE

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Background
Computerized prescriber order entry (CPOE) has been shown to decrease medication errors by as much as 80% in the adult patient setting. Studies of CPOE use for pediatric patients have shown similar results; however, specific needs also exist for this population. Pediatric patients, especially neonates, are less likely to compensate for small dosing errors relative to adults. Pediatric patients may lack the physiologic reserves to withstand medication dosing errors. In addition, pharmacodynamic and pharmacokinetic parameters differ significantly for children, as compared to adults, which further contribute to their vulnerability to adverse events. Current commercial CPOE systems, while adequate for the adult patients, may not address the specialized needs of pediatric patients.

Purpose
An analysis of the current pharmacy needs and/or satisfaction with CPOE would highlight the current progress made for pediatrics, as well as identify opportunities to meet future needs for this population.

Methodology
A survey was developed containing pediatric specific variables, informatics specific variables, and general pharmacy variables. The survey will be administered using an on-line format and will be administered to approximately 8,000 participants utilizing the ASHP list. Pharmacy managers in facilities that currently have CPOE systems in place will be surveyed to determine the extent to which pharmacy departments' needs are being met. Pharmacy managers in facilities without CPOE systems will be surveyed to ascertain their perceptions of the importance of various CPOE features to their respective departments.

Results/Conclusions
Results will be presented at the conference. Descriptive statistics will be applied to survey results and satisfaction scores. Regression analysis will be performed to compare pediatric facilities to adult/pediatric and adult only facilities. Conclusions will also be presented at the Great Lakes Conference.

Learning Objectives:

Identify how well pharmacy needs are being met by CPOE in pediatric and adult/pediatric and/or adult only facilities.

Compare/contrast the needs of pediatric facilities to adult/pediatric and/or adult only facilities.

Self Assessment Questions:

True or False CPOE systems designed for adult populations can be used in pediatric patients with no modifications.

True or False CPOE decreases medication errors by as much as 80% in the adult population and similar results have NOT been seen in pediatric patients.

EPOETIN DOSE OPTIMIZATION IN HEMODIALYSIS PATIENTS

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Purpose: Epoetin is safe and effective in treating anemia associated chronic kidney disease. Doses given by the intravenous (IV) route are often used in patients receiving hemodialysis (HD) on an inpatient and outpatient basis. However, the subcutaneous route has been shown to provide equal efficacy in maintaining target hemodynamic variables at decreased dose. Our institution currently administers epoetin for HD patients by the IV route. Administration by the subcutaneous route has the potential for substantial cost savings, as epoetin accounts for the highest drug expenditure in the Covenant Healthcare System.

Methods: Two inpatient groups will be compared during this pilot project: patients receiving IV epoetin and patients receiving subcutaneous epoetin. Patients receiving IV and subcutaneous doses are being identified for inclusion based on study criteria. Consent is being obtained for collection of laboratory data from outpatient hemodialysis centers. When a sufficient number of patients are enrolled in the IV group, pharmacy will then begin to prepare all epoetin doses for HD patients as subcutaneous injections with a 30% dose reduction based on the National Kidney Foundation recommendation. The IV and subcutaneous patients will continue to receive IV doses of epoetin at their designated outpatient centers after discharge. Data is being collected for the two groups beginning 30 days before admission, during admission, and 30 days after admission. These data include hemoglobin, hematocrit, iron status, blood transfusion history, and epoetin doses. The cost of epoetin during hospital admission will also be compared for the two patient groups.

Results/Conclusions: Converting from IV to subcutaneous epoetin should allow us to maintain patient outcomes and substantially decrease our cost of therapy. Findings will be presented to nephrologists and to the Pharmacy and Therapeutics Committee. Final data analysis and conclusions will be presented at the residency conference.

Learning Objectives:

Compare outcomes of hemodialysis patients who receive intravenous epoetin versus subcutaneous epoetin at a 30% dose reduction.

Assess the financial implications of an automatic conversion from IV to subcutaneous epoetin.

Self Assessment Questions:

True or False? An advantage to administering subcutaneous epoetin is its longer half life: 19-25 hours versus 4-16 hours when given intravenously.

True or False? Patients receiving hemodialysis should receive 30% more epoetin per dose when switched from intravenous to subcutaneous administration.

EVALUATION OF OUTCOMES FOLLOWING IMPLEMENTATION OF PROTOCOL DRIVEN ANEMIA MANAGEMENT

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Most patients with end stage renal disease (ESRD) develop anemia due to a decrease of endogenous erythropoetin. Darbepoetin alfa is a modified erythropoetin that has a longer half-life and subsequently requires less frequent injections compared with epoetin alfa. However, due to the long-acting nature of darbepoetin, adjusting therapy frequently or making large dosing adjustments create challenges for maintaining a patient within the target hemoglobin range of 11.0 gm/dL and 12.0 gm/dL. The objective of this study is to compare outcomes following implementation of an anemia management protocol in patients with ESRD receiving hemodialysis.

The Indiana University Outpatient Dialysis Clinic's electronic record system will be utilized to identify patients, who over the past three years, received therapy for anemia management while attending regularly scheduled dialysis sessions. Data collected from year one and two will compare patient outcomes following epoetin and darbepoetin therapy. Year three data will bring the implementation of a darbepoetin management protocol as well as an iron therapy management protocol. Patient data and outcomes from year three will be compared to year two darbepoetin data. The following data will be collected: monthly hemoglobin levels, darbepoetin/epoetin dose, number of missed darbepoetin/epoetin doses, iron saturation, ferritin levels, iron therapy prescribed, missed iron doses, hemoglobin change following iron therapy, number of darbepoetin/epoetin dose changes > 25%, number of epoetin dose changes within two weeks of another dose change, and number of darbepoetin dose changes within four weeks of another dose change. All data will be recorded without patient identifiers and maintained to protect patient confidentiality. Average hemoglobin over the six-month period as well as average darbepoetin and epoetin dose will be calculated. If available, documentation will be reviewed for adverse events that include gastrointestinal (GI) bleeding and infections.

Results are pending on completion of data collection.

Learning Objectives:

Compare patient outcomes following epoetin alfa therapy with darbepoetin alfa therapy in patients with ESRD receiving hemodialysis.

Evaluate the effectiveness of implementing darbepoetin alfa and iron therapy management drug use protocols.

Self Assessment Questions:

Darbepoetin alfa requires more frequent erythropoietin dosing compared to epoetin alfa due to its short half-life. T or F

Due to the long acting nature of darbepoetin alfa, adjusting therapy frequently or making large dosing adjustments increase the risk of overdosing or under-dosing. T or F

IMPACT OF IMPLEMENTING A PNEUMOCOCCAL VACCINATION ORDER FORM ON THE VACCINATION RATE FOR PNEUMONIA PATIENTS AT A COMMUNITY HOSPITAL.

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Purpose: The purpose is to determine the impact of implementing a pneumococcal vaccination order form on the vaccination rate. Additionally, we plan to determine why a percentage of patients were not evaluated by the physician to receive the vaccine.

Methods: The present study is part of a multidisciplinary quality assurance project to improve vaccination rate. A retrospective review of hospital charts, LastWord order entry system, and Midas database was conducted to determine the vaccination rate after form implementation. All admitted patients between July 6, 2005 and January 5, 2006 with a primary diagnosis of pneumonia were screened by quality review nurses for inclusion. After screening, the nurse placed a Pneumococcal Vaccination Order Form in the chart of all patients meeting inclusion criteria. Patients were included if they were ages 65 years or older, OR residents of a nursing home or chronic care facility OR ages 2-64 with any of the following conditions: chronic heart or lung disease (not asthma), cerebrospinal fluid leaks, chronic liver disease, immunocompromised, chronic kidney disease, diabetes mellitus, sickle cell disease, or asplenia. All other patients were excluded. Upon determination of inclusion, patients were further screened for eligibility to receive the vaccine during the hospital stay. The patient's physician through indicating any contraindication on the order form made final determination of eligibility. The contraindications include: allergy to pneumococcal vaccine or its components, currently receiving chemotherapy or radiation, previously immunized at age 65 years or older, previously immunized before age 65 years, but less than five years ago, patient refuses the vaccine, pregnant or nursing mother. Data will be analyzed with Chi-square statistics.

To date, approximately 150 pneumonia patient admissions have been reviewed, with approximately 40 remaining. Results will be presented to the institutions quality assurance department and appropriate physicians. Processes for improvement will be recommended as needed.

Learning Objectives:

To determine the impact of a pneumococcal vaccination order form on vaccination rate at a community hospital.

To be able to discuss why a percentage of patients were not evaluated by the physician to receive the vaccine.

Self Assessment Questions:

Vaccination order forms improve vaccination rates. T or F

A multidisciplinary approach to improving vaccination rate is effective. T or F

HIGH-DOSE INTRAVENOUS VERSUS STANDARD INFUSION OF NITROGLYCERIN FOR THE TREATMENT OF SEVERE ACUTE DECOMPENSATED HEART FAILURE: A RETROSPECTIVE ANALYSIS.

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Approximately five million people suffer from heart failure (HF) in the United States, with 500,000 newly diagnosed on an annual basis. Approximately one million hospital admissions per year are attributable to a primary diagnosis of acute decompensated HF. A decrease in contractility, secondary to HF, results in a neurohormonal response to increase the volume available to the heart. The combination of these two processes results in fluid retention and pulmonary edema, which has been associated with an inpatient mortality rate of 10 to 15% and an annual mortality rate of 34%. Early therapeutic interventions in acute cardiogenic pulmonary edema (ACPE) have been shown to be life saving. Currently, the American Heart Association guidelines recommend that ACPE be treated with sublingual nitroglycerin (NTG) initially with progression to intravenous (IV) nitrates in refractory cases.

Purpose: In addition to standard care in the treatment of ACPE, we believe that high-dose IV bolus NTG therapy will lead to significantly improved clinical outcomes without an increase in serious adverse events. The primary objective is to determine the rate of endotracheal intubations and bedside hemodynamics, specifically blood pressure, heart rate, respiratory rate, and oxygen saturation, with high-dose IV bolus NTG.

Methods: A retrospective chart review was performed on patients admitted to the emergency department at Detroit Receiving Hospital between August 2003 and August 2004 with an admitting diagnosis of ACPE. Patients were identified via ICD-9 code for HF. Diagnosis was made per physician examination, chest x-ray, and past medical history. Inclusions consisted of patients ³ 18 years of age who received IV nitroglycerin in the acute management of ACPE. Data collected include past medical history, medication administration, endotracheal intubation, heart rate, blood pressure, respiratory rate, oxygen saturation, and adverse effects.

Results and Conclusions: Data and results to be presented.

Learning Objectives:

To understand the mechanism of the body's response to HF that results in ACPE.

To understand the safety and efficacy of IV nitroglycerin bolus therapy in a patient with ACPE secondary to acutely decompensated HF.

Self Assessment Questions:

Acute cardiogenic pulmonary edema is a complication of HF that is associated with a high mortality rate. TRUE or FALSE

Fluid retention and pulmonary edema associated with acute decompensated HF is secondary to both a decrease in the contractility of the heart and the body's neurohormonal response. TRUE or FALSE

DEVELOPMENT AND IMPLEMENTATION OF PHARMACIST CONDUCTED ADMISSION MEDICATION HISTORIES AND RECONCILIATION IN AN ACADEMIC MEDICAL CENTER

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Reducing medication errors is a topic of national concern and activity. Preventing adverse drug events is a key component of the Institute for Healthcare Improvement's 100,000 Lives Campaign. The importance of accurately and completely reconciling medications across the continuum of care is also highlighted by its inclusion as one of Joint Commission on Accreditation of Healthcare Organizations' 2005 National Patient Safety Goals. Froedtert Hospital, a 426-bed academic medical center, lacked a standardized medication history process. Considerable variation and duplication of effort existed within the system, setting the stage for potentially preventable medication discrepancies and errors.

The goal of this project is to create and launch pharmacist conducted medication histories and a streamlined reconciliation process on all inpatient admissions, improving patient safety by prevent potentially significant medication discrepancies and maximizing pharmacist utilization as part of an integrated health care team.

Data from a completed medication history pilot justified the addition of three full time employees. A medication history workflow was designed and finalized in a multidisciplinary work group. The training program includes modules on conducting patient interviews and computer documentation. Medication histories are obtained on new inpatient admissions by a pharmacist. Data collection occurs within an electronic questionnaire and a progress note linked to each patient. The information is accessible to all providers for hospital and clinic visits. Two inpatient units are piloting a medication reconciliation process and workflow.

Parameters used to validate both models include: time to conduct a medication history and reconciliation, reliability and timeliness of a medication history, number of discrepancies found per patient, types of discrepancies, and severity of discrepancies. Data collection is ongoing and results will be presented at the Great Lakes Pharmacy Residency Conference. The results will be utilized to optimize the medication history and reconciliation workflow at Froedtert Hospital.

Learning Objectives:

Describe how pharmacy driven medication reconciliation can be accomplished in an academic medical center.

Understand the impact medication reconciliation has on patient safety.

Self Assessment Questions:

T/F Obtaining an accurate and complete medication history reduces the potential for medication errors upon admission to the hospital.

T/F Medication reconciliation is part of the Institute for Healthcare Improvement's 100,000 Lives Campaign.

IMPLEMENTATION OF A COMMUNITY PHARMACY BASED ADA RECOGNIZED DIABETES EDUCATION PROGRAM

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Background/Purpose: The American Diabetes Association (ADA) states that the “cornerstone of care” for all patients with diabetes who want to achieve successful health related outcomes is diabetes self-management education (DSME). Nevertheless, it has been documented that less than one-third of patients with diabetes receive comprehensive education. Community based programs like the Asheville Project and the PSM Diabetes program were successful in providing DSME; however, these programs were not recognized by the ADA. Though ADA recognition is not required in order to provide diabetes education, it does confer benefits. ADA recognition identifies the program as meeting national quality standards, stimulates referrals; and most importantly, meets criteria for Medicare reimbursement. Traditionally, ADA recognized programs are based in hospitals or outpatient clinics. To date, there are only a small number of ADA recognized programs in community pharmacies. The purpose of this study is to develop and implement an ADA recognized DSME program in a community pharmacy.

Methods: First, we established the program's organizational structure. This included selecting an advisory board, a program coordinator and formulating a policy and procedures manual. Next, we selected the instructional team and finalized the curriculum. Finally, we approved the continuous quality improvement process. Patient enrollment began January 2006 and is continuous. Patients can be referred to the program by physician referral, pharmacist referral, or self-referral. Up to six individual educational sessions with a pharmacist and/or dietician are scheduled over no more than three months. Patients are assessed for weight, blood pressure, blood glucose, and foot care at each visit and other clinical indicators at baseline, 3 months, 6 months, and 1 year. Each patient receives an individualized educational plan and set of behavior goals. Currently, there is no fee to participate in this program.

Results/Conclusions: Data collection is in progress.

Learning Objectives:

To describe the process of implementing an ADA recognized DSME in a community setting.

To determine if an intervention by a pharmacist affects disease awareness and behavior in patients with diabetes.

Self Assessment Questions:

ADA recognition is required to provide comprehensive diabetes education. T or F

DSME can be provided by:

a. pharmacists
b. dieticians
c. nurses
d. all of the above

IMPROVEMENT OF DVT PROPHYLAXIS PRACTICE AT A COMMUNITY HOSPITAL

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Background
Deep vein thrombosis (DVT) is a common and costly disease. In the United States alone, more than 500,000 people are diagnosed annually with treatment costing $1 billion to $2.5 billion. DVT is also associated with a high mortality rate estimated to be up to 21% in elderly patients. Several trials show proper prophylaxis decrease the incidence of DVT.

A DVT prophylaxis protocol was initiated at St. Margaret Mercy in Hammond, Indiana, an 800-bed community hospital, in April 2005. A medication use evaluation (MUE) was performed using 50 charts from January (prior to protocol) and 50 charts from May (after protocol initiation) to establish the baseline DVT prophylaxis rate. Prior to protocol initiation, 18% (n=9) of patients received prophylaxis, 54% (n=27) did not, and 28% (n=14) had a contraindication. After protocol initiation, 44% (n=22) of patients received prophylaxis, 38% (n=19) did not, and 14% (n=7) had a contraindication. Each group experienced 1 adverse event when anticoagulation was discontinued while the patient remained at high risk. Implementation of a protocol increased the number of patients assessed and prophylaxed. However, results were suboptimal. The purpose of the project is to improve the rate of DVT prophylaxis at St. Margaret Mercy through education.

Methods
Education was provided to improve compliance to the DVT prophylaxis protocol. The following measures were performed: flyers posted in nursing units, inservices provided to pharmacy and nursing staff, articles published in the hospital newsletter, and presentations to nursing committees and at Quality Council Committee. In addition, the protocol was revised with input from the nursing staff. Fifty charts will be pulled from December 2005 to assess the compliance of DVT prophylaxis.

Results and Conclusion
Results and conclusion will be presented at the conference.

Learning Objectives:

To review complications of deep vein thrombosis (DVT).

To review DVT prophylaxis options.

Self Assessment Questions:

True or False Hospitalized patients rarely develop a deep vein thrombosis.

True or False DVT prophylaxis protocol initiation can increase compliance.

SENSITIVITY/SPECIFICITY EVALUATION OF FLUOROMETRY TO ENHANCE SAFETY IN THE COMPOUNDING OF HIGH-RISK PARENTERAL MEDICATIONS

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Based on the known problems with visual human checks in the IV compounding process, a form of assistive technology was sought in order to create a best practice and improve the safety of the medication system. Fluorometry was identified as a potential means of providing an automated check of parenteral medications. The objective of this study is to evaluate the effectiveness of a table-top fluorometer as an automated final check in the preparation of parenteral admixtures by testing the machine's sensitivity/specificity with several medications, concentrations, and diluents.

This is a single center study to be conducted by the Department of Pharmacy Services at the University of Michigan Medical Center. The table-top fluorometer (ValiMed device) will be used to validate compounded high-risk parenteral medications, including: insulin, epinephrine, morphine, hydromorphone, lorazepam, gentamicin, vancomycin, and dopamine. Unique fluorescent signatures have been developed for each of these medications by testing different wavelengths of ultraviolet light and measuring their ability to create a unique fluorescence pattern. Ten sample sets, each comprising of various dilutions ranging from 10-fold above to 10-fold below the target concentration, will be tested for each drug/concentration/diluent combination. Tests for all dilutions of a given drug will be performed using the same test button on the ValiMed device as though the sample was actually at the target concentration. Data that will be collected include date and time of the scan, observed result of the scan (validated/not validated), and the channel value of the scan in a text file format. Cross-testing will be performed in order to study whether or not the ValiMed device can distinguish between different drugs. Data collected will be used to analyze the machine's sensitivity and specificity for the different medications. The results and conclusions will be analyzed and presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Explain the known problems with visual human checks in the parenteral medication compounding process.

Discuss the sensitivity and specificity of the ValiMed device in the validation of parenteral medications.

Self Assessment Questions:

How does the ValiMed device aid in the medication safety process?

What is the sensitivity and specificity of the device?

EVALUATION OF THE INCIDENCE AND ANTIBIOTIC SUSCEPTIBILITY PATTERNS OF COMMUNITY-ASSOCIATED METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS IN SKIN AND SOFT TISSUE INFECTIONS.

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Methicillin-resistant Staphylococcus aureus (MRSA) is recognized as a pathogen responsible for a variety of infections amongst various patient populations. MRSA colonization in the community was rarely seen prior to the year 2000. Studies are now showing an increase in frequency of CA-MRSA infections, with the majority of them being skin and soft tissue infections (SSTIs). According to the Centers for Disease Control (CDC), a person with a MRSA infection can be classified as having a CA-MRSA infection if they have: 1) the diagnosis made in an outpatient setting or by a culture that is positive for MRSA within 48 hours of hospital admission; 2) no previous medical history of MRSA infections or colonizations; 3) no prior one year history of hospitalization, nursing home, skilled nursing or hospice admission, dialysis, or surgery; and 4) no permanent indwelling catheters or medical devices that pass through the skin into the body. Currently, the CA-MRSA incidence is reported to be 0.2%-2.8% in urban populations. Studies also show antibiotic susceptibilities vary by region. While guidelines exist to help practitioners choose antimicrobial therapy for these infections, due to regional variability, local data should be considered when empirically treating CA-MRSA.

This is a retrospective study designed to find the incidence of CA-MRSA SSTIs at our institution from January 1 - December 31, 2005. It also evaluated our antibiotic susceptibility patterns of Hospital-associated MRSA (HA-MRSA) and CA-MRSA. A subgroup analysis was performed on all S. aureus isolates followed by a chart review to determine if a patient had HA-MRSA or CA-MRSA, as defined by the CDC. With this data, the incidence of CA-MRSA was determined. The HA-MRSA antibiotic susceptibility patterns were compared with those of CA-MRSA to determine the most appropriate empiric therapy in our institution. Antibiotics used in this analysis include vancomycin, sulfamethoxazole/trimethoprim, linezolid, clindamycin, and tetracycline.

Learning Objectives:

Distinguish between community-associated and hospital-associated methicllin-resistant S. aureus.

Understand how to choose empiric antibiotics for community-associated methicillin-resistant S. aureus.

Self Assessment Questions:

T/F There is no difference between CA-MRSA and HA-MRSA. CA-MRSA is simply HA-MRSA found in the community.

T/F The only way to cure a CA-MRSA infection is by prescribing antibiotics.

EVALUATION OF APREPITANT USE IN ADOLESCENT PATIENTS

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Purpose: Aprepitant, a neurokinin-1-receptor antagonist, is approved as adjunctive therapy for the treatment of chemotherapy-induced nausea and vomiting (CINV) in adults. The National Comprehensive Cancer Network developed a set of practice guidelines for adult CINV. Information regarding the use of aprepitant in the adolescent population is limited to two published case reports. This drug utilization evaluation will evaluate aprepitant therapy in adolescent patients receiving chemotherapy which is classified as highly-emetogenic.

Methods: Patients greater than 12 years of age diagnosed with Ewing or osteosarcoma will receive aprepitant 125mg on day 1 and 80mg on day 2 of chemotherapy, as consistent with adult dosing approved by the Rush Pharmacy & Therapeutics Committee. In addition, patients will receive concomitant anti-emetic therapy with dexamethasone and ondansetron as per Rush University Medical Center (RUMC) Children's Hospital dosing protocols.

Nausea and vomiting will be the primary outcomes, and appetite and mucositis secondary outcomes. Outcome data will be recorded on a standardized data collection form kept in the patient's bedside chart. Safety will be measured by assessing adverse drug reactions documented in the adult population, and efficacy will be measured using a nausea scale, as well as the number of vomiting episodes per day. In addition to prospective data, the data collection tool will be used to collect retrospective patient data from the previous year. Both the prospective and retrospective data will be used to develop a protocol for the use of aprepitant as an adjunctive anti-emetic therapy in the adolescent pediatric population.

Conclusions: To date, two patients have been enrolled prospectively and six patients retrospectively. No formal conclusions can be drawn with regard to efficacy or safety, however ongoing evaluation of these patients is currently underway.

Learning Objectives:

Outline chemotherapy agents which are designated as highly emetogenic per the National Comprehensive Cancer Network guidelines.

Identify unique pharmacologic and pharmacokinetic properties of aprepitant and describe its role in preventing chemotherapy-induced nausea and vomiting.

Self Assessment Questions:

Which chemotherapy agents are considered to be highly emetogenic according to the National Comprehensive Cancer Network guidelines?
a.Daunorubicin
b.Cisplatin (>50mg/m2)
c.Bleomycin
d.Cyclophosphamide (>1500mg/m2)
e.Both B and D (answer)
f.None of the above

For what indications is aprepitant approved?
a.Acute nausea and vomiting associated with highly emetogenic chemotherapy in patients > 18 years of age
b.Anticipatory nausea and vomiting associated with highly emetogenic chemotherapy in patients > 18 years of age
c.Delayed nausea and vomiting associated with highly emetogenic chemotherapy in patients > 18 years of age
d.Delayed nausea and vomiting associated with highly emetogenic chemotherapy in patients < 18 years of age.
e.Both A and C (answer)
f.A, C, and D

REVIEW OF THE IMPACT OF NEWER INSULIN ANALOGS VERSUS TRADITIONAL INSULIN THERAPIES IN A VETERAN POPULATION

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There has been a strong push for practitioners to achieve tight glycemic control with diabetic patients, as a result of accumulated patient-oriented evidence that indicates such practice can decrease morbidity and mortality. Conventional therapy with NPH and regular insulin has delayed onset of action that requires stringent timing of insulin injections and meals. On the contrary, use of prandial and basal insulin is supposed to closely mimic physiologic insulin release in a healthy adult, which can provide more flexibility in insulin administration. Therefore, theoretically such a regimen should provide tighter glycemic control. However, the use of newer insulin analogs has not shown to reduce HbA1c in clinical trials when compared to conventional therapy in diabetic patients.

The objective of this retrospective, single center, chart review study is to assess the practical implications of using the newer insulin analogs for diabetic patients at the Cincinnati Veterans Administration Medical Center (VAMC). The primary outcome will be to determine if the combination of insulin aspart/glargine decreased hypoglycemic events when compared to NPH/regular insulin regimens in a veteran population. Two secondary outcomes will be evaluated. The first one will evaluate any change in glycosylated hemoglobin (HbA1c) after a patient was started on the newer insulin analogs. Finally, to see if the wide glucose excursions are decreased, the actual range of home blood glucose readings will be compared.

The Cincinnati VAMC's electronic patient record system will be utilized to identify patients who are at least 18 years of age and have received treatment for diabetes with insulin aspart/glargine from January 2002 to July 2005. Data collected include: patient age, comorbidities, frequency of documented hypoglycemia, HbA1c, glycemic range from home blood glucose readings, medication refill records, and clinic monitoring patient.

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

Learning Objectives:

To evaluate the difference in glycemic control between patients on NPH/regular insulin versus insulin aspart/glargine.

Assess the value of measuring glycemic control using HbA1c, incidence of hypoglycemic events, and home fasting blood glucose levels.

Self Assessment Questions:

Newer insulin analogs provide tighter glyceimic control than traditional insulin therapy. T/F

HbA1c always decreases with tighter glycemic control. T/F

ADVERSE EVENTS ASSOCIATED WITH VACCINATION OF INFANTS IN THE NEONATAL INTENSIVE CARE UNIT AT SIXTY DAYS OF LIFE

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Purpose: The administration of diphtheria-tetanus-acellular pertussis-inactivated polio-Haemophilus influenzae type B (DTaP-IPV-HIB) to preterm infants has been associated with an increase in cardiorespiratory events (apnea, bradycardia, and/or desaturation). The purpose of this study is to assess whether treatment changes made near the time of vaccine administration contribute to these adverse events.

Methods: A retrospective chart review of seventy preterm infants who received DTaP, IPV, HIB, Hepatitis B, and heptavalent pneumococcal vaccines while hospitalized between January 1, 2004 and October 31, 2005 was conducted. Adverse events defined as apnea, bradycardia, and desaturation measured pre and post vaccine administration were documented. Recent changes in medical management with regard to oxygen requirement, caffeine administration, formula or feeding route, and environment (open crib versus heated isolette) were recorded. The infants were divided into two groups: those who exhibited an increase in cardiorespiratory events and those who did not. Statistical analysis was performed using Fisher's Exact Test to compare the frequency of changes in medical management between the two groups.

Results: Thirty-nine medical records have been reviewed. Thirteen of the thirty-nine infants (33%) had an increase in apnea, bradycardia, and/or desaturation. Of those thirteen subjects, eleven had at least one recent change in medical management (85%). In the group that did not have an increase in cardiorespiratory events, eighteen of twenty-six patients had at least one recent change to therapy (69%), p=0.45.

Conclusion: Interim results indicate there is not a statistically significant difference of change in medical management between infants who experienced an increase in cardiorespiratory events versus those that did not after vaccine administration.

Learning Objectives:

List at least three factors that can influence the number and/or severity of cardiorespiratory events (apnea, bradycardia, and/or desaturation) in preterm infants.

Determine which preterm infants may be at risk for experiencing an increase in cardiorespiratory events after the administration of standard 2-month vaccinations.

Self Assessment Questions:

Which of the following changes in medical management surrounding the time of 2-month vaccine administration should be avoided if possible?

a. Discontinuation of caffeine
b. Change in feeding route
c. Wean to open crib
d. A and C
e. All of the above

Which of the following is true regarding acetaminophen administration at the time of 2-month vaccine administration?

a. Acetaminophen doses should be scheduled Q6H for 48 hours after vaccination
b. The acetaminophen dose is 30 mg/kg per dose
c. The first dose of acetaminophen should be given 30-60 minutes prior to vaccination
d. Acetaminophen should be given Q8H as needed for fever

RETROSPECTIVE STUDY OF APPROPRIATE USE OF CLOPIDOGREL IN THE VA POPULATION

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Objective: Data found in both the CAPRIE trial and CURE study suggest the use of clopidogrel as an alternative to aspirin or in combination with aspirin for decreasing the incidence of cardiovascular death, recurrent myocardial infarction or stroke. However, recent results from the MATCH trial have shown that the combination of aspirin and clopidogrel may not be beneficial for secondary prevention of stroke in regards to a significant increase in major bleeding events. This study will assess the appropriate use of clopidogrel, length of treatment, and possible adverse effects or complications during treatment within a VA population.

Methodology: IRB approval was obtained before study initiation. Electronic medical records were used to identify patients receiving clopidogrel therapy during 2004. A list of approximately 260 patients was generated by selecting every tenth chart for review. Data collected included: patient demographics, prescribing medical service, indication and duration of therapy, concurrent medications, cardiovascular events/complications, and significant laboratory values and blood pressure readings.

Results: Preliminary results are available on 150 patients. The average age was 55 years, 100% were male and 75% were Caucasian. All patients received clopidogrel 75mg daily. Duration of clopidogrel therapy averaged 30 months, with a range from 1-92 months. Adverse events occurred in 11% of the patients with a total of 24 incidents recorded. The most common indication was stent placement in 30% of patients. Cardiovascular complications were experienced by 29% of patients with a total of 72 events. Primary care physicians initiated or prescribed 77% of clopidogrel prescriptions.

Conclusion: In this population, 90% of patients were prescribed clopidogrel for an appropriate indication. The average length of therapy may be longer than necessary based on current guidelines, but this study was not powered for comparison testing. Less than a third of the study population experienced a subsequent cardiovascular or adverse event.

Learning Objectives:

List appropriate indications for clopidogrel and recognize average length of therapy according to evidence-based medicine.

Identify potential adverse events that may occur during therapy with clopidogrel and other anticoagulant/antiplatelet agents.

Self Assessment Questions:

T or F According to the CAPRIE trial, Clopidogrel use for prevention of stroke, MI or cardiovascular death has been shown to be consistently beneficial in patients with peripheral vascular disease.

Although there are no specific monitoring parameters listed within the clopidogrel package insert, which of following are appropriate monitors:

a. CBC
b. Bleeding time
c. LFTs
d. All of the above

THE EFFECT OF THE INFLUENZA VACCINE ON INTERNATIONAL NORMALIZED RATIO AND WARFARIN ANTI-COAGULATION

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Background: Anecdotal evidence suggests influenza vaccine can affect the international normalized ratio (INR) of patients taking warfarin. Results from previous studies are conflicting.

Objective: The purpose of this study is to determine the effects of influenza vaccine on warfarin anti-coagulation.

Methods: The inclusion criteria for this prospective observational study include stable INR and stable dose of warfarin for at least 4 weeks and meeting criteria for influenza vaccination. Exclusion criteria include egg allergy, change in INR that can be attributed to a factor other than the vaccine, or history of noncompliance with warfarin. Subjects will be given a single intramuscular dose of influenza vaccine and have an INR on day 0. Subjects will be asked to take their home supply of warfarin as per their regular schedule. Patients will then return for an INR on day 7, 14 and 21 post vaccine. The change in INR will be calculated for each visit at 7, 14 and 21 days and compared to the INR at day 0. A change of >=0.5 or greater in the INR is considered a clinically significant change.

Preliminary Results: Sixteen patients were enrolled; five were excluded because their INR at enrollment was not in range and three were excluded because a dose change was required. At one week post-vaccine, one patient's INR had decreased by a clinically significant amount (>=0.5). At two weeks, two patients had INR's that had increased by >=0.5. At three weeks post-vaccine, four patients (50%) had an INR value increase by >=0.5. No other clinically significant changes were noted. No adverse events were experienced during the study including bruising, bleeding or thrombotic events.

Conclusions: Preliminary data suggests that influenza vaccine may slightly elevate the INR 3 weeks after vaccination. More patients need to be enrolled in order to confirm this finding.

Learning Objectives:

To identify what effect, if any, the influenza vaccine has on warfarin anticoagulation

To state how this effect might change the management of a patient taking warfarin and receiving the influenza vaccination.

Self Assessment Questions:

TRUE OR FALSE: When a patient receives an influenza vaccine and is taking warfarin, his/her warfarin dose should be empirically reduced by half at 3 weeks post vaccine

The current standard of care for a patient receiving warfarin and an influenza vaccine is:

A. Check an INR within 1 week of receiving the vaccination
B. No change in management
C. Empirically increase the dose by 20% for 3 weeks after the vaccine
D. There is currently no standard of care for this situation

PREPARATION, IMPLEMENTATION, AND ANALYSIS OF BAR-CODE MEDICATION ADMINISTRATION TECHNOLOGY

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Purpose:
Frequently, medication errors occur at administration, presenting a risk to patient safety and increased health care costs. Barcode medication administration (BCMA) has been shown to significantly reduce administration errors and the Joint Commission supports BCMA within the 2006 Patient Safety Goal to improve accuracy of patient identification. Froedtert Hospital, a 426-bed academic medical center, is preparing for BCMA. The purpose of this project is to facilitate the planning, design, coordination and implementation of BCMA and to develop and coordinate data collection and success metrics.

Methods:
A multidisciplinary team was formed to develop a project plan with the goal of a summer 2006 pilot. Medication error data at Froedtert Hospital was evaluated for the frequency and severity of administration errors and to assess potential impact of BCMA. The main scope of the resident project is inpatient pharmacy preparation through mapping inventory and distribution workflows. Analysis of pharmacy processing has allowed planning for workflow alteration and response to potential problems. Final areas of preparation include analysis of oral liquids data to develop product specific versus order specific barcoding and completion of the transition to compatible barcodes of bulk repackaged products. Medication administration workflows are being analyzed for BCMA incorporation into nursing practice. The new technology is being tested with simulation of various scenarios, products, and locations to identify and resolve potential technology and workflow problems. Pre-implementation data collection and analysis is being performed with development of success and quality assurance metrics.

Results:
The project is on track to complete preparation for inpatient BCMA for summer 2006 pilot. Final outcome measures will evaluate impact on medication error rates and success of the implementation.

Conclusion:
BCMA is an effective mode to decrease medication administration errors. The steps of implementation are extensive and require dedication of a multidisciplinary team with time and financial resources.

Learning Objectives:

Understand pharmacy distribution and medication administration and identify error-prone steps.

Understand steps involved in implementation of a hospital wide technology system and potential benefits and limitations of barcode point-of-care technology in reducing medication administration errors.

Self Assessment Questions:

How does BCMA affect incidence and type of medication administration errors?

What steps are needed to complete inpatient pharmacy readiness for BCMA?

REVIEW OF ANTINEOPLASTIC AGENTS AND THEIR METABOLISM BY THE CYTOCHROME P450 (CYP) SYSTEM

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Drugs are prescribed on the basis of medication characteristics and on the probability that reliable and reproducible clinical effects will result. However, interpatient variability in drug response is common, leading to challenges in optimizing a dosage regimen for an individual patient. There are more than 2 million cases of adverse drug reactions that occur annually in the United States, with an estimated 100,000 deaths. Such variability in drug response among patients is multifactorial, including environmental, genetic, and disease determinants. These factors affect the disposition (absorption, distribution, metabolism, and excretion) of any given drug. Drugs may be metabolized by a variety of sequential or competitive chemical processes involving oxidation, reduction, and hydrolysis (phase I reactions) or glucuronidation, sulfation, acetylation, and methylation (phase II reactions). Metabolism of many common drugs is well characterized, but our understanding of antineoplastic agents and their disposition is largely undescribed in a comprehensive way in the medical literature.

Our goal is to build a database that documents antineoplastic agents and their known metabolic pathways. As our database grows, we plan to build a website that lists antineoplastic agents and their CYP pathways. The site will link antineoplastic agents to the research paper that reported the specified metabolic pathway. We will use Irinotecan metabolism as a model to demonstrate the workings of the database. This website will serve as a platform for future research with oncology specific agents to define pharmacokinetics, phamacodynamic and pharmacogenomic parameters.

Learning Objectives:

Understand the metabolic pathway of Irinotecan

Describe the influence of genetic polymorphisms on Irinotecan metabolism

Self Assessment Questions:

Metabolism of antineoplastic agents plays a vital role in the course of therapy and the incidence of adverse reactions. (T/F)

Cytochrome p450 is the only avenue of drug metabolism in humans. (T/F)

EVALUATION OF ONDANSETRON PRESCRIBING AND EFFICACY IN TREATING NAUSEA AND VOMITING UNRELATED TO PONV AND CINV

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PURPOSE: Ondansetron is currently indicated for the treatment of post-operative nausea and vomiting (PONV) and chemotherapy-induced nausea and vomiting (CINV). The purpose of this prospective medication usage evaluation is to describe the characteristics of patients receiving ondansetron for treatment of nausea and vomiting unrelated to PONV and CINV, and to determine the effectiveness of ondansetron in this patient population.

METHODS: Thirty patients with ondansetron orders were randomly selected and included if they were on a general medicine floor and at least eighteen years of age. Exclusion criteria included PONV, CINV, and pregnancy. Demographic information, probable causes of nausea and/or vomiting, and all antiemetic doses were recorded. A patient-interview and chart review regarding antiemetic efficacy and adverse drug reactions was performed. Treatment with other formulary antiemetics (promethazine, prochlorperazine, metoclopramide, trimethobenzamide) or any precautions or contraindications to these agents were documented.

RESULTS: The mean patient age was 58.3 years and 70% were female. Internal medicine physicians prescribed 67% of all the ondansetron orders. The most probable cause of nausea and/or vomiting was unknown in one-third of patients. Ondansetron was prescribed as a first line agent in 77% of patients and no patient had a contraindication to all other available formulary antiemetics. The ondansetron dose most commonly prescribed was 4 mg IV Q6H PRN, with patients averaging 5.2 doses each. Overall, fifty-five percent of patients experienced relief of nausea and/or vomiting with ondansetron. After receiving a one-time dose, there were 127 additional doses given suggesting these may be unnecessary based on ondansetron's mechanism of action.

CONCLUSIONS: Ondansetron was used as the first line antiemetic for the majority of patients and provided relief of nausea and/or vomiting for approximately half of these patients. The opportunity to reduce off-label prescribing of ondansetron involves utilizing other formulary agents.

Learning Objectives:

Evaluate the use of ondansetron for treatment of nausea and vomiting unrelated to PONV and CINV.

Construct potential solutions to optimize antiemetic therapy by increasing the utilization of alternative antiemetic agents and/or reducing ondansetron dosing.

Self Assessment Questions:

There is literature to support the use of ondansetron for the treatment of nausea and/or vomiting unrelated to PONV and CINV. T or F

Approximately half of patients experienced relief of nausea and/or vomiting with ondansetron. T or F

STANDARDS FOR THE PREVENTION OF VENOUS THROMBOEMBOLISM (VTE) AND THEIR IMPACT ON PRESCRIBING PRACTICES IN A COMMUNITY TEACHING HOSPITAL

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OBJECTIVES:
The objectives of this study are to develop clinician tools to aid in the identification and management of patients at risk for VTE, to compare the percentage of eligible patients receiving VTE prophylaxis before and after implementation of the tools, and to measure compliance with recommended means of prophylaxis.

METHODS:
A prospective chart review of medical and surgical patients (100 each) was performed in December 2005 to identify the percentage of eligible patients who were receiving VTE prophylaxis. Recommendations from the American College of Chest Physicians and the primary literature were reviewed to develop an algorithm for VTE prophylaxis of medical patients and institution-specific standards for the prevention of VTE. The algorithm and standards will be distributed as clinician tools to aid in identification and management of patients at risk for VTE. Post-intervention data will be collected and compared to baseline data.

RESULTS:
Medical charts were reviewed for 200 patients (20 patients were excluded). Baseline results indicated that 82% (50/61) of eligible medical patients and 80% (55/69) of eligible surgical patients received an appropriate means of VTE prophylaxis. However, 75% (18/24) of medical patients and 88% (23/26) of surgical patients who were ineligible for VTE prophylaxis still received prophylaxis.

CONCLUSIONS:
Greater than 80% of medical and surgical patients eligible for VTE prophylaxis received an appropriate means of prophylaxis. However, SJMH needs to prevent patients from unnecessarily receiving VTE prophylaxis.

Learning Objectives:

To identify risk factors for venous thromboembolism and patients who need prophylaxis.

To define appropriate pharmacological and mechanical means of prophylaxis for venous thromboembolism in medical and surgical patient populations.

Self Assessment Questions:

Name at least 4 risk factors for venous thromboembolism.

T/F Unfractionated heparin and enoxaparin are equally efficacious for venous thromboembolism prophylaxis across all surgical patient populations.

IMPLEMENTATION OF A ROBOTIC COURIER MEDICATION DELIVERY SYSTEM

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Many hospital departments including pharmacy rely on manual cart delivery to distribute product throughout the organization. Robotic couriers are self-guiding, self-propelling carts that can be used to supplement or replace manual delivery of medications or supplies throughout the hospital. The objective of this study is to implement a robotic courier distribution system for routine inpatient medication delivery services and measure its impact on cost, service, and efficiency versus the existing manual delivery system.

A return on investment analysis was performed to identify projected financial benefits of robotic courier technology for the hospital and pharmacy department. A vendor agreement was negotiated to pilot the technology in select patient care areas. Members of a multidisciplinary implementation team including pharmacy; nursing, central supply, facilities, biomedical engineering and information systems were assembled. Issues being addressed by the team include number of couriers needed, delivery route and elevator selection, facility layout modifications, desired system communication enhancements, staff education material development and approval of methods for measuring the impact of this technology. Major workflow changes are necessary and training of staff is ongoing on two pilot units.

Extensive data is being collected to measure system impact on operating expense, service, and overall system efficiency. Before and after measures include changes in delivery labor requirements, electricity usage, human courier cycle time and employee satisfaction regarding the system's perceived impact on overall service quality. Total implementation and projected ongoing operating expenses and savings will be analyzed to help determine whether the system will be implemented beyond the pilot phase for house-wide medication delivery and whether expanded use in other departments is plausible. Detailed methods, results and next steps will be presented.

Learning Objectives:

Construct an accurate return on investment for a robotic courier medication delivery system.

Predict the feasibility of the robotic courier medication delivery system at your institution.

Self Assessment Questions:

What are the steps for implementation of a robotic courier medication delivery system?

What technology and information systems does the robotic courier medication delivery system interface with?

IMPLEMENTATION OF A HEADACHE MANAGEMENT PROGRAM FOR PHARMACISTS IN A COMMUNITY PHARMACY SETTING

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Purpose: Historically headache has always been a leading reason people seek the assistance of a pharmacist. Yet few pharmacists are adequately trained to manage this condition. The objectives of this study are to develop and implement an educational program about headache management for community pharmacists and to measure their knowledge, confidence, and the frequency of recommendations to physicians and patients.

Methods: The objectives will be measured by a pre and post survey method. The surveys will consist of three sections; knowledge assessment, confidence, and frequency of recommendations to physicians and patients. The pre-survey will be given to the pharmacists who attend a headache management CE program given by the pharmacy resident in February 2006. The targeted audience is Chicago area pharmacists in a grocery store setting. The CE program will be a two-hour live, interactive session reviewing headache's pathophysiology, assessment tools, non-pharmacological and pharmacologic treatments, stratified care therapy approaches, and case studies. Approximately one month following the program, the pharmacists will be administered the post survey.

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

Conclusions: It is predicted that the scores in the knowledge section of the survey will increase after the CE program along with the confidence level for headache counseling. We also expect an increase in the number recommendations given to headache patients. This data will help to further develop and refine practical treatment approaches for community pharmacists to assist headache sufferers.

Learning Objectives:

To increase pharmacist awareness of their impact on headache treatment

To identify methods a pharmacist can increase their knowledge about headache

Self Assessment Questions:

True/False. Headache patients should always use OTC products for their headache pain.

True/False. A pharmacist in the community setting is a great resource for headache patients to learn more about their condition?

FREQUENCY OF MYALGIAS OR RHABDOMYOLYSIS WITH COMBINATION USE OF GEMFIBROZIL AND SIMVASTATIN IN A VETERAN POPULATION.

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Objective: The package insert of simvastatin contains precautionary warnings stating patients should not exceed 10mg of simvastatin daily, in combination with gemfibrozil, unless the benefits are likely to outweigh the increased risks of the combination. Results of previous studies indicate that there is between a 0.12-5% risk of myalgias in patients treated with statins and fibrates. The objective of this study is to determine the frequency the combination of simvastatin, in doses greater than 10mg, and gemfibrozil were discontinued due to rhabdomyolysis or myalgias at the Cincinnati VAMC. The secondary objectives are to determine if the frequency of discontinuation of the combination was higher with increasing doses of simvastatin and patient outcomes as a result of the stopping the offending agents.

Methodology: This is a retrospective chart review of the electronic medical records of 150 patients taking doses exceeding 10mg of simvastatin, in combination with gemfibrozil, at the Cincinnati VAMC from 2000-2005. Each chart will be reviewed for a new diagnosis of rhabdomyolysis or written record that combination therapy was discontinued. The reason for discontinuation will be categorized into one of the following: rhabdomyolysis, myalgias, any other intolerance, or change in therapy due to failure to achieve ATP III goals on simvastatin 80mg and gemfibrozil. Charts will also be reviewed for demographic information, co-morbidities, and patient outcomes after therapy was discontinued. Statistical analysis will include descriptive statistics on patients whose medication was discontinued due to rhabdomyolysis or myalgias, the frequency of discontinuation of the combination by dose of simvastatin, and patient outcomes in which the combination was stopped. Correlation analysis of simvastatin dose to discontinuation and chi square analysis of the frequency of discontinuation stratified by simvastatin dose will be performed.

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

Learning Objectives:

To understand the implications of the concomitant use of simvastatin and gemfibrozil

To understand which adverse events patients being treated with simvastatin and gemfibrozil are at greatest risk of developing

Self Assessment Questions:

True or False: The incidence of adverse events of combination use of gemfibrozil and simvastatin increased with increasing doses of simvastatin in the study.

True or False: Patients with hypertension, diabetes mellitus, and/or pre-existing muscle conditions are at increased risk of developing myalgias on simvastatin and gemfibrozil according to the literature.

IMPLEMENTATION OF ELECTRONIC CLINICAL MONITORING SYSTEMS AND ASSESSMENT OF IMPACT

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Background: Pharmacists continue to gain recognition as vital members of multi-disciplinary care teams and are therefore increasingly involved in the utilization of laboratory, clinical, and humanistic data to provide recommendations to optimize medication therapy. Due to the increasing complexity, amount and type of data utilized, pharmacy is in need of a comprehensive and systematic data documentation system.

Purpose: Objectives of this project are to work with a team of pharmacist to develop a new electronic clinical documentation system within our current pharmacy system, evaluate the use of computers on wheels (COWs) versus tablet PCs as the hardware medium to support the new documentation system, implement the new system on selected units and evaluate pharmacist usage patterns, satisfaction and perceived benefit of the new system.

Methods: At the University of Wisconsin Hospital & Clinics (UWHC) pharmacists currently use paper-based monitoring forms to document patient-specific medication issues, to facilitate communication between pharmacists and to provide a quick reference of issues identified during daily profile review for subsequent discussion while on patient care rounds. Three documentation forms, varying in design depending on the unit and acuity of the patient, are currently utilized by the UWHC decentral pharmacy teams. In effort to improve access and standardization, an electronic monitoring system within the pharmacy computer system has been developed for pilot on two decentral units. Medication profile filters by therapeutic class (e.g. immunosuppresants, antibiotics, etc) and the ability to move between patients quickly via a user-defined patient list are also being developed. Finally, pharmacist mobile workstation preference to support the new documentation system will be evaluated in a cross-over design study comparing a COW to a tablet PC.

Results/Conclusion: Detailed methods, results and plans for the future will be presented at the conference.

Learning Objectives:

Develop an understanding of the role technology plays in supporting patient care activities.

Describe common features of mobile devices and associated advantages and disadvantages.

Self Assessment Questions:

List two software enhancements made to aid in utilization of the electronic documentation system.

User-friendly functionality plays a significant role in technology acceptance.

EFFECTS OF AN AUTOMATED CENTRALIZED PHARMACY CAROUSEL DISPENSING SYSTEM ON INVENTORY CONTROL, FINANCIAL MANAGEMENT, AND WORKLOAD.

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Much of a pharmacy's costs are wrapped up in inventory and many losses are realized through medication expiration or product misplacement due to a large and difficult to manage inventory. Furthermore, cost recovery and billing of orders are complex processes that consume manpower and are error prone. Technology principles have long been used in pharmacy to streamline processes and aid in cost containment. Despite anecdotal evidence to support purchasing pharmacy-level dispensing technology for financial reasons, there is little research to support this claim. The objective of this study is to determine the extent to which a new carousel-based dispensing system will allow for a smaller and better managed inventory, streamline billing, ordering, and dispensing processes, and will help reduce expired and misplaced medications.

The carousel medication dispensing system will be implemented in May, 2006. Data is collected as “pre-data”, prior to implementation, and “post-data”, after implementation. Measurable topics will be divided into three groups: Workload, Inventory, and Financial. Workload is measured in terms of delivery to satellite pharmacies, clinics, and OmniCell machines as a function of employee time spent on these tasks. Inventory is measured in terms of total count and par levels of medications. Inventory control is measured by the amount of lost or unaccounted medications and the amount of returns based on return reports. Financial impact is measured in terms of labor cost, inventory cost, and billing costs.

Our most recent inventory totaled 422,419 items (5,421 line items) worth $5,277,592.19. The average delivery to time to the automated dispensing machines and to the pharmacy satellites prior to implementation is currently being evaluated. An examination of the returns reports shows that on average we return 32 drug items per day due to expiration.

Postdata has not been assessed due to delays in the implementation of the pharmacy carousels.

Learning Objectives:

Compare and contrast technological and manual processes for pharmacy inventory management.

Discuss the potential impact of pharmacy carousel technologies on the pharmacy inventory management process.

Self Assessment Questions:

Describe the manual process of pharmacy inventory management and highlight the potential areas where automation can reduce workload and errors (both medication use and inventory errors).

What are the proposed impacts of pharmacy carousel technology on the medication use process?

EFFECT OF MELATONIN ON TAXANE-INDUCED NEUROPATHY IN BREAST CANCER PATIENTS

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Neurotoxicity caused by taxane chemotherapies can be dose limiting and can cause decreases in quality of life. There are no approved therapies for treatment or prophylaxis of this neurotoxicy. Melatonin has been evaluated for its use in decreasing adverse reactions of chemotherapy and its impact on chemotherapy efficacy. The primary objective of this pilot study is to determine if melatonin, given during taxane chemotherapy, will decrease the incidence of neuropathy.

Approximately 50 patients who are beginning chemotherapy with paclitaxel, albumin-bound paclitaxel, or docetaxel will be enrolled in this study. Patients enrolled will be females with stage II, III, or IV breast cancer who have no underlying neuropathy. During the initial evaluation baseline information including age, stage of breast cancer, information about previous chemotherapy regimens, history of diabetes mellitus and control of diabetes mellitus will be collected. Patients will start melatonin 21 mg daily at bedtime when their chemotherapy begins. They will continue melatonin for 28 days after their last dose of taxane chemotherapy. A final evaluation will be done 28 days after melatonin is discontinued. If the patient continues on taxane chemotherapy for longer than 6 months, melatonin will be discontinued after 6 months of therapy and the final evaluation will be done at that time. Patients will be assessed every 28 days for incidence and severity of neuropathy using the NCI-CTC 3.0 scale for neuropathy and assessment for possible side effects of melatonin. The FACT-TAXANE quality of life assessment will be completed by the patient at enrollment and at the final evaluation visit. Data will be analyzed to evaluate the incidence of neuropathy, the severity of neuropathy, and changes in quality of life.

Currently two patients have been enrolled in the study and data collection is ongoing. Preliminary results and conclusions will be presented at the conference.

Learning Objectives:

List different chemotherapy agents that cause neuropathy.

Identify agents, including melatonin, that have been studied for the prevention or treatment of chemotherapy-induced neuropathy.

Self Assessment Questions:

Which of the following types of chemotherapy agents is least likely to cause neuropathy?
a. Vinca alkaloids (ie. vincristine)
b. Taxanes (ie. paclitaxel)
c. Platinum compounds (ie. cisplatin)
d. Anthracyclines (ie. doxorubicin)

Chemotherapy-induced neuropathy may necessitate reduced doses of chemotherapy, held doses of chemotherapy, or changes in chemotherapy regimens.
a. True
b. False

QUALITY AND SAFETY IMPROVEMENT IN THE MEDICATION USE SYSTEM FOR TOTAL NUTRIENT ADMIXTURES

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Background: The complexity and opportunity for error in the medication use process for the provision of total nutritional admixture (TNA) parenteral nutrition is higher than the average medication.

Purpose: The objective of this study is to review and implement a revised system of parenteral nutrition within the University of Wisconsin Hospital and Clinics healthcare system.

Methods: A multidisciplinary team composed of the resident, pharmacists, physicians, nurses, and dieticians was formed to review the current TNA medication use system and to identify high-impact sources of error and areas for improvement. The beginning of the study involved finding a TNA process improvement opportunity, organizing a team who understood the process, clarifying the current knowledge of the process, uncovering the root cause of variation or poor outcome, and implementing a method to improved outcomes. The TNA order form was revised to display 5 consecutive days of therapy with an attached carbon copy for each day of therapy. Modifications to the ordering form format were made regarding the listing of the various components of the TNA. Patient Safety Net, a program utilized to report medication use errors, was utilized to both identify past reported events, causes of events, and to analyze data as changes took place. An automated compounding device (ACD) was purchased and implemented that included the addition of micronutrients (e.g., electrolytes). A three-month retrospective review was conducted to identify prescribing and transcription errors prior to the implementation of the new systems. A prospective review of prescribing, transcription, and administration errors was implemented and is underway to monitor for adverse events associated with the revised process of TNA therapy. A tailored data collection tool will be utilized for further data collection and outcomes research on the impact of the specific changes chosen.

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

Learning Objectives:

To identify the need for revisions made to the parenteral nutrition therapy process.

To assess the efficacy of a revised process of total nutrient admixture prescribing, compounding, and administration at UWHC.

Self Assessment Questions:

Most medication errors associated with parenteral nutrition occur in:
A. The prescribing process
B. The compounding process
C. The administration process

A common factor associated with a parenteral nutrition prescribing error is:
A. Inadequate knowledge regarding parenteral nutrition therapy
B. Certain patient characteristics related to parenteral nutrition therapy (e.g., age, impaired organ function)
C. Calculation of parenteral nutrition dosages
D. Specialized parenteral nutrition dosage formulation and prescribing nomenclature
E. All of the above

DEVELOPMENT OF A PHARMACIST-INITIATED RENAL DOSING PROTOCOL

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Purpose: Many drugs, including many antimicrobials, H-2 receptor antagonists, and low molecular weight heparins require dosage adjustment in patients with renal impairment. Pharmacists possess the necessary knowledge and skills to provide this essential dosing service. The purpose of this project is to evaluate the current system for renal dosing of drugs at St. Marys Hospital Medical Center, and to implement a new process permitting pharmacists to automatically adjust drug doses appropriately for patients' renal function.

Methods: Currently, pharmacists at St. Marys Hospital Medical Center monitor all patients with an estimated creatinine clearance less than 30 mL per minute. This information is documented in the pharmacy computer system and is used for pharmacists to identify drugs requiring dosage adjustments, and contact prescribers to recommend these necessary changes. To evaluate the current renal dosing process, some baseline data will be collected. During a two-week period, pharmacists throughout the hospital will record each renal dosing recommendation made including the drug involved, the patient's estimated creatinine clearance, method for contacting the prescriber, and whether the recommendation was accepted. Once this data has been collected, several steps will be taken to develop a renal dosing protocol. First, it will be decided which drugs to include in the automatic renal dosing protocol. The policies and procedures for pharmacists to follow will be outlined in a written protocol which will be presented to the Pharmacy and Therapeutics Committee for approval or further modifications.
Results and conclusions:
Data collection is ongoing, and the results and conclusions will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Identify the medications most commonly dose-adjusted based on renal function at St. Marys Hospital Medical Center.

Describe the process of developing and implementing a renal dosing service.

Self Assessment Questions:

What are the benefits of a pharmacist-initiated renal dosing protocol?

In which types of patients can estimated creatinine clearance (using Cockcroft-Gault equation) be a misleading estimate of renal function?

EVALUATION OF CLOSTRIDIUM DIFFICILE-ASSOCIATED DIARRHEA IN PATIENTS AT CLARIAN HEALTH PARTNERS

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Background: Each year in the United States, infection with Clostridium difficile accounts for up to three million cases of diarrhea and colitis and 1.1 billion dollars in health care costs. Factors, associated with an increased risk for C. difficile infection, are listed as follows: increased age, antibiotic therapy, immunosuppression, prolonged hospital stay, antacid use, recent gastrointestinal procedure, and sharing a room with a patient infected with C. difficile. Timely diagnosis and treatment, in conjunction with proper isolation procedures and disinfection methods, help prevent the transmission of C. difficile.
Purpose: The purpose of this study is to evaluate risk factors, treatment, isolation procedures, and transmission rates in patients with Clostridium difficile-associated diarrhea.
Methods: This study is an observational, retrospective chart review of 534 patients with a reported positive C. difficile toxin who were admitted to Methodist Hospital and Indiana University Hospital during the time frames of January 1, 2004, to June 30, 2004, and January 1, 2005, to June 30, 2005. Data collection (in progress) includes the following: patient demographics, number of days in the hospital, hospital room transfer status, infectious and non-infectious medical history, previous and current antibiotic therapy, antacids received, isolation procedures, and confirmed positive C. difficile toxin and cultures.
Results and Conclusion: Results and conclusions are pending based on completion of data collection.

Learning Objectives:

Identify the risk factors associated with an increased risk for C. difficile-associated diarrhea.

Recommend appropriate treatment and isolation procedures for patients with C. difficile- infection.

Self Assessment Questions:

What are three important risk factors for the development of C. difficile-associated diarrhea?

T or F: Once C. difficile infection is suspected, the patient should be placed into isolation.

PREDICTING HEART FAILURE EXACERBATIONS IN WARFARIN TREATED PATIENTS

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Background: The anticoagulant response to warfarin is affected by many exogenous factors such as concomitant medications, diet, and various disease states. Heart failure is one disease state that has been shown in the literature to be a risk factor for overanticoagulation. One study actually identified a trend toward decreased warfarin dosing requirements in the time preceding the date of incidental heart failure. This trend has also been observed at the St. Vincent Primary Care Center pharmacist-run anticoagulation clinic. The purpose of this study is to examine whether an elevation in INR can be predictive of an exacerbation of heart failure.

Methodology: This six-month prospective pilot study was conducted at the St. Vincent Primary Care Center. Inclusion criteria were patients who have a clinical diagnosis of heart failure, are anticoagulated with warfarin for any reason, and are followed by the pharmacist-run anticoagulation clinic. Exclusion criteria were subjects experiencing heart failure symptoms at the time of PT/INR draw, any subject who is pregnant, or <18 years old. At each anticoagulation visit patients were weighed and asked standard anticoagulation assessment questions as well as additional questions pertaining to signs and symptoms of heart failure based on the Kansas City Cardiomyopathy Questionnaire. Any subject with an elevated INR for any reason received follow-up phone calls on days 1, 3, 7, and 10 following the initial blood draw to assess for signs and symptoms of heart failure. Primary outcome measures include number of heart failure exacerbations, number of heart failure exacerbations after an elevated INR, percentage of heart failure exacerbations that were preceded by an elevated INR, average elevation of INR in patients with an exacerbation, and days to exacerbation following an elevated INR.

Results/Conclusions: Preliminary results will be presented at Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Identify the factors that can lead to an elevated INR

Describe the pathophysiology of the increased response to warfarin in patients with heart failure.

Self Assessment Questions:

Both incidental heart failure and chronic heart failure are risk factors for overanticoagulation. True / False

What is the mechanism of overanticoagulation with warfarin resulting from heart failure?

EVALUATION OF WARFARIN PRESCRIBING PRACTICE IN A COMMUNITY HOSPITAL

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Purpose

Warfarin is the most frequently prescribed oral anticoagulant and the fourth most prescribed cardiovascular agent in the United States. Because of its narrow therapeutic window, patients taking warfarin require close monitoring to avoid serious side effects such as bleeding. In November 2003, the Pharmacy and Therapeutics (P&T) Committee approved a warfarin protocol. However, warfarin-related adverse drug reactions (ADRs) remain as the most commonly reported ADR. The purpose of this study is to examine the warfarin prescribing practices and outcomes in an 800-bed community hospital.

Methods

A list of patients who received warfarin from April to May 2005 was generated. Charts were randomly selected from the list for retrospective review. A medication utilization evaluation (MUE) form was developed to collect patient demographics, warfarin dose, INR level, adverse effects, and interventions.

Results

Forty-four charts were reviewed. Of patients taking warfarin prior to admission, 6 (14%) had a supratherapeutic INR. Eighteen patients (41%) were given loading doses. Twenty-nine patients (66%) reached therapeutic INR while 16 (36%) did not. An average of 2.5 days (ranging from 1 to 5 days) was needed to reach therapeutic INR. It took 2 patients (4%) more than 7 days to reach therapeutic INR. Fourteen patients (32%) had a supratherapeutic INR. Eight patients (18%) required medical intervention due to supratherapeutic INR. Three patients (7%) experienced bleeding. The warfarin protocol was not utilized in any of the charts reviewed.

Conclusion

A high percentage of patients were given loading doses, which led to supratherapeutic INRs, requiring medical interventions. The warfarin protocol was developed to decrease the number of ADRs, however it is underutilized. These findings have been presented to the P&T committee. Recommendations have been made for education to increase usage of the warfarin protocol and to initiate an outpatient anticoagulation service.

Learning Objectives:

Review the adverse drug effects of warfarin

Review the warfarin dosing as recommended by current practice guidelines

Self Assessment Questions:

T/F Bleeding associated with warfarin may occur anywhere in the body.

T/F Loading patients with warfarin will allow them to achieve therapeutic quicker.

IMPROVING THE INAPPROPRIATE USE OF LEVOFLOXACIN IN THE EMERGENCY DEPARTMENT AND INTENSIVE CARE UNIT

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Purpose

Levofloxacin is the preferred fluoroquinolone antibiotic used by practitioners at Victory Memorial Hospital (VMH) for covering gram-positive and gram-negative bacterial infections. The objective is to assist the prescribing of levofloxacin in the Emergency Department (ED) and Intensive Care Unit (ICU). Through appropriate utilization, VMH should be able to slow the emergence of resistant pathogens as seen through the antibiogram.

Methodology

This study was approved by the Institutional Review Board. A retrospective medication use evaluation (MUE) was conducted on patients at least 18 years of age started on levofloxacin therapy at the time of admission to ED or ICU. Three criteria were assessed: the therapeutic indications, appropriate dose, and the potential for IV to PO conversion. After reviewing current literature and interpreting the MUE results, the pneumonia protocol was updated and implemented. A follow-up MUE will be done to assess compliance to the protocol with further adjustments carried out in the future as needed.

Results

Thirteen percent of patients were not diagnosed with an infectious process but were started on levofloxacin. Therapy was continued even when the diagnostic labs confirmed negative. A total of 11 patients (28.2%) with CrCl < 50ml/min were not renally adjusted with an average delay of 2.9 days before appropriately dosed. Twenty-five patients (64%) were started on IV with an average delay of 1.3 days after PO eligible before switching. The sums of all costs associated with the inappropriate use of levofloxacin were in excess of $500 per month.

Conclusion

A follow-up MUE was accomplished in January 2006. The results of this MUE will be discussed in the presentation.

Learning Objectives:

Describe levofloxacin pharmacokinetics, indications of use, and dosing for patients with renal dysfunction

Understand the pathophysiology of pneumonia and the role of levofloxacin

Self Assessment Questions:

What is the appropriate levofloxacin dose and frequency for a pneumonia patient with CrCl of 30ml/min (assuming patient po tolerable)?
A. 250mg po daily B. 500mg po every other day C. 750mg po every other day

What is the oral bioavailability of levofloxacin?

EVALUATION OF ONDANSETRON UTILIZATION IN THE MANAGEMENT OF POST-OPERATIVE NAUSEA AND VOMITING (PONV)

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The purpose of this study is to evaluate the impact of clinical pharmacy education on the appropriate utilization of ondansetron (Zofran®) in the inpatient post-operative setting.

Methods: A retrospective chart review will be conducted on inpatient post-operative patients who have been prescribed and received at least one dose of IV ondansetron (Zofran®) on their nursing unit at Riverside Methodist Hospital. A pharmacy generated trigger report along with a Pyxis medication usage report will identify patients charged for the use of ondansetron during the month of November 2005. A randomly selected sample will be obtained to utilize for data collection. Clinical pharmacist will then provide educational tools and lectures to nursing staff and surgery residents focusing on areas including, appropriate ondansetron usage for PONV, strategies to decrease patients' baseline risk, multimodal therapy and the overall cost of antiemetic therapy. A second retrospective chart review will evaluate randomly generated patients and will be conducted during the month of March 2006 after clinical pharmacy education has been completed. Retrospective data collection will include: demographics, risk stratification, prescribing patterns and antiemetic utilization. Data collected will be used to evaluate the appropriateness of current prescribing habits and use of anti-emetics in post-operative patients. In addition, the medication usage report will help to identify number of doses charged to patients as well as any significant decrease in overall cost to the Department of Pharmacy. Results from this study will be used to re-design post-operative general surgery physician protocols and help to evaluate current anti-emetic guidelines to improve patient care and help minimize cost in the post-operative setting.

Results: Data is currently being collected. Results and conclusion will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

To describe the process of risk stratification, and identify appropriate and inappropriate uses of ondansetron in post-operative patients.

To determine when to use multimodal therapy in the treatment of PONV and its impact on cost-effective therapy.

Self Assessment Questions:

Which of these is a not a patient-specific risk factor that contributes to PONV?
a. History of motion sickness or PONV
b. Age
c. Non-smoker
d. Use of post-operative opioids

True or False: Repeated doses of ondansetron are beneficial in treating recurrent PONV

INVESTIGATING THE ROLE OF A CLINICAL PHARMACIST IN THE EMERGENCY DEPARTMENT OF A COMMUNITY TEACHING HOSPITAL.

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Purpose: The often fast pace and demanding atmosphere of the emergency department (ED) allows for potentially dangerous medication errors to occur. Recent literature suggests that the addition of a clinical pharmacist to the ED can prevent errors and improve patient care. Borgess Medical Center is a 426-bed community teaching hospital and Level I Trauma Center. The ED staff treats approximately 42,000 patients per year with 22% requiring admission to the hospital. Currently, the ED is remotely supported by pharmacy staff from the central pharmacy. The purpose of this project is to investigate the role of a clinical pharmacist in the emergency department.

Methods: A satisfaction survey will be completed by the physicians and nursing staff prior to the pilot study. Then, for one month, a clinical pharmacist will be physically present in the ED during peak hours to document interventions, answer drug information questions, perform advanced medication reconciliation, and monitor for adverse drug events and drug-allergy interactions. After the pilot has been finished, a repeat survey will be completed to evaluate satisfaction and perceived value of a clinical pharmacist. Intervention documentation and satisfaction data will be reviewed and summarized for impact.

Results:
Survey and intervention results will be collected during the month of February.

Conclusion:
To be announced at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Recognize the need for clinical pharmacy services in a community hospital emergency department.

Identify areas in the emergency department where clinical pharmacists can provide pharmaceutical care.

Self Assessment Questions:

True or False- A clinical pharmacist in the emergency department can strengthen relationships between the emergency and pharmacy departments.

Which of the following areas can a clinical pharmacist provide pharmaceutical care in the emergency department?
a. Medication reconciliation
b. Drug information
c. Drug-allergy monitoring
d. Medication intervention
e. All of the above

A RETROSPECTIVE AND CONCURRENT EVALUATION OF PHENYTOIN FOR THE DEVELOPMENT OF A PHARMACIST-MANAGED PHENYTOIN PROTOCOL

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Phenytoin is the most extensively used anticonvulsant on the market. Due to its unique pharmacokinetic/pharmacodynamic profile, phenytoin dosing and monitoring is complex and difficult to master. The purpose of this project is to develop guidelines and/or a protocol for the standardization of phenytoin use in patients > 18 years of age. This project will consist of four parts: a retrospective chart review of past adverse drug reactions (ADRs) and medication errors, a concurrent medication use evaluation (MUE) of phenytoin, a review of phenytoin and fosphenytoin, and the development of dosing and administration guidelines and/or a protocol. Fosphenytoin is currently a non-formulary product at ALGH but with the development of phenytoin guidelines, its use will be re-evaluated.

Data collection for the retrospective chart review will include all patients admitted between January and June 2005. The MUE will be conducted November 2005 – February 2006 and will include inpatients > 18 years of age who have received at least one dose of phenytoin. Demographics, labs, prescribers, indications, length of therapy and types of pharmacist interventions will be collected.

To date, retrospective chart review of phenytoin-related ADRs (n=11) has revealed that 64% of ADRs were due to supratherapeutic levels along with signs and symptoms of toxicity. From November 2005 – January 2006 there have been 6 additional ADRs reported. Preliminary results from the MUE indicate that loading doses are not weight-based, baseline labs are not consistently drawn prior to initiation of therapy and levels are not always interpreted correctly.

Final data collection and analysis is in progress and will be presented in April.

Learning Objectives:

To understand the dosing and pharmacokinetic issues associated with both phenytoin and fosphenytoin

To list the most common signs/symptoms of phenytoin toxicity

Self Assessment Questions:

Renal failure and hypoalbuminemia are two major causes of increased phenytoin levels due to a decrease in protein binding and consequently an increase in the free fraction of drug. T or F

What signs or symptoms might you see with a total serum phenytoin level > 20mcg/mL?
a) Nystagmus
b) Rash
c) Slurred speech
d) Coma
e) All of the above

RISK FACTORS FOR PERIPHERALLY INSERTED CENTRAL CATHETER AND CENTRAL VENOUS CATHETER INFECTIONS

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PURPOSE: Peripherally Inserted Central Catheters (PICC) offer an alternative to traditional Central Venous Catheters (CVC) for patients who will require long-term intravenous therapy and patients receiving intravenous therapy outside of a healthcare institution. In the out-patient setting, PICC's have a low incidence of catheter-related blood stream infection (BSI). A recent study in Chest called into question the safety of PICC's in the intensive care unit when the investigators found a similar infection rate in PICC's and CVC's. Another recent study remarked the catheter type may not be the most important factor in catheter-related BSI. Other factors, such as duration of use, frequency of dressing changes, and infection control policies, were suggested to be more important. This study was undertaken to determine whether the catheter-related infection rates were different between PICC's and CVC's in our intensive care unit. Additionally this study reviewed several risk factors to determine which factors may be important in identifying potential BSI.

METHODS: A list of patients with catheter-related BSI in the intensive care unit was acquired from the Department of Infection Control at Clarian Health Partners. Data collected by Infection Control from the second half of 2004 and the first half of 2005 regarding the infection rates of CVC's and PICC's were used to compare the two infection rates. A subpopulation of approximately 20 patients with PICC-related BSI and CVC-related BSI was selected randomly from the Infection Control list to complete chart reviews. A chart review and search of patients' laboratory tests was performed to identify factors that may contribute to infection. Factors addressed include nutritional status, concomitant disease, duration of use, number of manipulations, compliance with infection control policies, and use of antimicrobials or immunosuppressing agents prior to positive cultures.

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

Learning Objectives:

Provide the CDC definition of catheter-related blood stream infection.

Compare the infection rates of PICC's and CVC's in high-risk patients according to recent primary literature.

Self Assessment Questions:

A positive blood culture with an organism that is associated with infection at another site in the body is considered a blood stream infection. T/F

The rate of catheter-related infection in PICC's and CVC's in high risk patients was not found to be significantly different in a recent prospective trial. T/F

COMPARISON OF GLYCEMIC CONTROL AND INCIDENCE OF HYPOGLYCEMICIA IN NON-CRITICALLY ILL PATIENTS UTILIZING SLIDING SCALE INSULIN VS PATIENT SPECIFIC INSULIN LISPRO CORRECTION TABLES

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Background
Recent position statements from the American College of Endocrinology (ACE) and Institute of Safe Medication Practices (ISMP) recommend the implementation of patient-specific standardized insulin protocols, due to the improved glycemic control as well as lower rates of hypoglycemia associated with their use.
Our institution is implementing patient-specific lispro insulin correction tables that will take into account the patient's insulin needs. The purpose of the correction tables is to supplement patient's current insulin therapy and help prevent unexpected hyperglycemia caused by the stress of the patients' illness.

Purpose
To compare glycemic control and incidence of hypoglycemic episodes of patient specific insulin lispro correction tables with the traditional insulin sliding scale in non-critically ill hospitalized patients requiring insulin therapy.

Methods
This study is a retrospective randomized chart review at Evanston Northwestern Healthcare. Adult hospitalized patients with hyperglycemia (fasting BG > 126 or random BG > 200 mg/dL) requiring insulin therapy, whom had orders for sliding scale during the months of February through May of 2005, or had orders for insulin lispro correction tables during the months of February through May of 2006 will be included. Pregnant patients, patients requiring an insulin drip, and patients less than 18 years of age will be excluded.
Primary outcome measures will be the following: percentage of pre-meal, bedtime, and nocturnal BG within the target of 110 mg/dL for fasting and a maximal BG of 180 mg/dL, and the incidence of hypoglycemic episodes defined as a BG < 70 mg/dL.
Secondary outcome measures will include: accuracy in which the insulin lispro correction table were ordered, incidence of regular sliding scales continued to be ordered, and the incidence of patients with continued hyperglycemia for which insulin therapy was not adjusted.

Data is currently being collected, and the results will be presented at the Great Lakes Conference.

Learning Objectives:

To identify the importance of implementing patient-specific standardized insulin protocols to achieve glycemic control in hospitalized patients

To identify the risk factors that may predispose patients to hypoglycemia

Self Assessment Questions:

Insulin lispro has a more favorable pharmacokinetic profile that mimics our physiologic insulin production and therefore has a lower risk of hypoglycemia and achieves more desirable post-prandial BG levels. T or F

The ACE BG goal for hospitalized non-critically ill patients:
a. 110 mg/dL
b. Pre-meal BG of 80 mg/dL and a maximal BG of 110 mg/dL
c. Pre-meal BG of 110 mg/dL and a maximal BG of 180 mg/dL

AN EVALUATION OF ENOXAPARIN DOSING IN PATIENTS WITH RENAL DYSFUNCTION

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Purpose: Enoxaparin is an anticoagulant medication used in the treatment and prevention of thrombosis. Specific dosing recommendations exist for patients with renal dysfunction. The appropriateness of enoxaparin dosing in patients with renal dysfunction (creatinine clearance of < 30 ml/min) was evaluated.

Methods: This concurrent review evaluated inpatients who were prescribed enoxaparin between December 1 and December 31, 2005 at Cleveland Clinic. Inclusion criteria: patients >= 18 years of age prescribed enoxaparin and serum creatinine > 1.2 mg/dl. Creatinine clearance was estimated utilizing the Cockroft-Gault equation. The prescribed dose of enoxaparin was evaluated based on current FDA recommendations according to indication for treatment and renal function. Descriptive analysis was performed to evaluate enoxaparin use and determine the percentage of enoxaparin patients dosed by recommended guidelines. Demographics, indication, presence of dialysis, and use of anti-factor Xa assay was also evaluated. Prescribers were contacted if a prescribed dose required renal dose adjustment.

Results: Of the 615 orders for enoxaparin, 97 met criteria for estimation of creatinine clearance. Twenty-eight patients had a calculated creatinine clearance < 30 ml/min. Thirteen (46%) did not have the recommended dose reduction of enoxaparin. Twenty patients were prescribed renal dosing of enoxaparin when their calculated creatinine clearance did not require this reduction.

Conclusions: Fifty-four percent of patients with renal dysfunction received the appropriate dose of enoxaparin. Some patients may receive a renal dose reduction when it may not be necessary. These results will be used to address prescribing habits and further refine the pharmacy department's current renal dose monitoring program for enoxaparin.

Learning Objectives:

Identify patients that require enoxaparin dose adjustment

Review the recommendations for enoxaparin in renal dysfunction

Self Assessment Questions:

How did the manufacturer of enoxaparin estimate the creatinine clearance of patients when determining dosing recommendations?

When dosing enoxaparin, what are the guidelines for appropriate dose reduction in individuals with renal dysfunction?

EFFECTIVENESS OF AN EDUCATION INTERVENTION FOR RESPIRATORY CARE PHARMACISTS IN A COMMUNITY CHAIN SETTING

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Objective: Community pharmacies can improve patients' lives by providing cognitive pharmaceutical services (CPS). CPS have been documented to improve health outcomes and provide cost savings. However, incorporation of CPS has been slow due to many factors, including pharmacists' educational and workplace barriers. To successfully implement CPS, it is important to provide educational interventions targeted towards pharmacists. The purpose of this study is to determine the effect of an educational intervention on the rate of patient interactions reported by specially-trained respiratory care pharmacists in a community chain setting.

Methods: Nineteen pharmacies where respiratory care pharmacists are employed in a national pharmacy chain are targeted for the study. An educational intervention was provided to participating pharmacists based on needs identified by a focus group. The primary outcome will be the change in the interaction rate (number of documented patient interactions/qualifying opportunities) in the two months immediately preceding and following the intervention. Pharmacy characteristics that may impact pharmacists' ability to perform interactions (prescription volume, respiratory care pharmacist hours, total pharmacist hours, technician hours, pharmacy hours of operation, position of the respiratory care pharmacist, concurrent disease management programs) will also be recorded.

Results: Results to be presented include the number of documented patient interactions, qualifying opportunities, and pharmacy characteristics for each pharmacy. Numerical data obtained during the pre-intervention period will be compared to the numerical data obtained during the post-intervention period.

Conclusions: Data collection is in process. Results and conclusions of the study will be presented at the conference. Analysis of the data will help identify if an educational intervention improved documentation rates or if pharmacy characteristics are a barrier to pharmacist to document patient interactions.

Learning Objectives:

To identify potential barriers to documentation in a community chain setting.

To relate the effectiveness of providing an educational intervention on documentation rates of clinical services in a community chain setting.

Self Assessment Questions:

T/F An educational intervention for respiratory care pharmacists has been shown to improve documentation rates in a community chain setting.

T/F Pharmacy characteristics may need to be addressed to improve documentation rates in a community chain setting.

EVALUATION OF RECOMBINANT FACTOR VIIA IN CARDIOTHORACIC SURGERY PATIENTS

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PURPOSE

In 1999, recombinant human factor seven (rFVIIa) was approved by the Food and Drug Administration (FDA) for the treatment of bleeding in hemophilia A or B patients with acquired coagulation factor inhibitors. Recombinant Factor VIIa, complexed with tissue factor, can activate coagulation factors IX and X to factors IXa and Xa, respectively. Due to the quick achievement of hemostasis, the off-labeled use of rFVIIa to control post-operative bleeding is increasing in popularity. This practice presents several concerns, primarily because randomized clinical trials to support this use are lacking. With thrombosis as an associated risk, and the exponential costs of rFVIIa, it is appropriate to evaluate its use in our open heart surgery population. The primary objective of this retrospective review is to compare factor seven use at our institution with recent released consensus guidelines. Secondarily, we will determine the incidence of adverse events, blood product utilization and in hospital mortality following factor VIIa administration.

METHODS

A retrospective review, from June 2001– December 2005, will be performed in open heart surgery patients, > 18 years of age who received rFVIIa. According to our Information Warehouse, 267 patients were billed for rFVIIa during June 2001 – December 2005. Of these 267 patients, 95 patients were on the open heart surgery service. Baseline demographics, body temperature, pH, renal function (SCr/BUN), liver function (LFTs) and significant past medical history will be recorded. Pertinent home medications (warfarin, aspirin, clopidogrel) and in-hospital anticoagulant therapy will be recorded. The baseline INR, PT, aPTT, ACT, fibrinogen, PLT, Hbg and HCT will be documented. The initial dose of rFVIIa, time to hemostasis and the need for repeat doses of rFVIIa will be identified. All data will be reported using descriptive statistics.

RESULTS/CONCLUSIONS

Data Collection is currently underway. Results and conclusions will be presented at the conference.

Learning Objectives:

Describe the use of recombinant activated factor VII for post-operative bleeding following cardiothoracic surgery.

Determine if there is an increased risk of thrombotic events following administration of rFVIIa in our patient population.

Self Assessment Questions:

Use of rFVIIa should be preceded by the administration of hemostatic agents and should not be used as lone therapy. T/F

Recombinant Factor VIIa causes immediate thrombosis by directly creating a thrombin plug at the site of bleeding. T/F

BIOLOGIC DISEASE MODIFYING ANTIRHEUMATIC DRUG (DMARD) UTILIZATION IN A VA POPULATION: A RETROSPECTIVE ANALYSIS

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Objectives:
To determine the effectiveness, safety, and cost associated with the use of biologic disease modifying antirrheumatic drugs (DMARDS) in VA patients.

Methods:
This study is a retrospective chart review of Madison VA patients who began treatment demonstrated by pharmacy record of adalimumab, etanercept, or infliximab on or before June 13, 2005 or rituximab on or before August 15, 2005. Study data will not be collected beyond December, 2005. Data to be collected includes the following: indication for biologic use, concomitant non-biologic DMARDS, concomitant corticosteroid use, initial and final dose of biologic DMARD, number of doses, duration of biologic DMARD therapy, adverse reactions to DMARD, pain score, Erythrocyte Sedimentation Rate (ESR), C-reactive protein (CRP), Health Assessment Quesionnaire (HAQ) score, number of active joints (includes swollen and tender joints), duration of morning stiffness, provider assessment, and physician global assessment if present for each rheumatology clinic visit. A cause of death and reason for exclusion will also be collected if applicable.

The study will include all patients seen by rheumatology clinic at the William S. Middleton Memorial VA in Madison, WI that have received a biologic DMARD for rheumatoid arthritis or spondylarthropathy on or before the specified dates. Patients using a biologic DMARD solely for the indications of inflammatory bowel disease or psoriasis without arthritis will be excluded. Patients receiving biologic DMARDS from an outside provider (i.e. not initiated at the VA) will also be excluded.

Results:
The primary endpoint, DMARD effectiveness, will be assessed by review of documented objective data and subjective improvement. The secondary endpoints, safety, and cost will be determined based on adverse drug reaction data collected and the number of doses of biologic agent received.

Conclusion: TBD

Learning Objectives:

Determine effectiveness of biologic DMARDS at the Madison VA.

Determine safety and cost associated with biologic DMARD use in the VA population.

Self Assessment Questions:

List the 3 most common side effects associated with infliximab.

T/F: Rituxan, when used for Rheumatoid Arthritis is dosed annually.

AN EVALUATION OF A VALIDATED VANCOMYCIN DOSING NOMOGRAM IN THE CRITICALLY ILL POPULATION

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Background: In our institution vancomycin is dosed based on a validated nomogram that takes into account the patients' weight and renal function to give predicted troughs between 5 and 20mcg/ml. This nomogram does not require routine vancomycin measurements in stable patients with a creatinine clearance above 30ml/min. However, monitoring may be useful in patients with a creatinine clearance less than 30ml/min, patients on prolonged therapy or those patients receiving concomitant aminoglycosides.

Purpose: The purpose of this study is to evaluate the use of the vancomycin nomogram in the critically ill population to determine the reliability of the nomogram to give therapeutic troughs.

Methods: This retrospective chart review included patients admitted to the ICU from January 2004 to July 2005. Patients were included if prescribed vancomycin with dosing based on the nomogram and a vancomycin trough obtained during their stay in the ICU. Patients were excluded if they were not dosed based on the nomogram either due to rapidly changing renal function, creatinine clearance less than 30ml/min or extremes of weight (<50kg or >110kg). Data collected includes demographic information, past medical history, APACHE II scores, type of infection, initial vancomycin dose, trough level obtained, maximum temperature, serum creatinine and white blood cell count through the duration of therapy.

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

Learning Objectives:

To assess the reliability of a validated vancomycin nomogram in the critically ill population

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

Self Assessment Questions:

A 79 year old end stage renal disease patient would be a good candidate to be dosed with vancomycin using the nomogram. T/F

A critically ill trauma patient with a rapidly changing volume of distribution and rapidly changing renal function would be a good candidate to receive vancomycin dosed based on the nomogram. T/F

DESIGNING AND IMPLEMENTING AN ONLINE ADVERSE DRUG EXPERIENCE REPORTING SYSTEM

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PURPOSE: Adverse drug experience (ADE) reporting by St Marys Hospital Medical Center (SMHMC) pharmacists has decreased over the past five years. Contributing factors include increased pharmacist workload and the inconvenience of paper-based ADE reporting systems. A customized online ADE reporting system would likely improve ADE reporting compliance due to greater accessibility and ease of use. An online database would also help simplify the organization and tabulation of ADE statistics to determine trends and results of interventions.

METHODS/RESULTS: An ideal system would be one that is secure, easy to use, and capable of fast, efficient, and accurate ADE data entry. Steps involved in developing the ideal system for SMHMC include: distribution of pharmacist surveys to evaluate the current ADE reporting system, investigation of commercially available ADE software to determine baseline functional needs, comparison of Microsoft® Excel, Microsoft® Access, and other software applications for ease of use, and comprehensive review of online software templates for design appeal.

CONCLUSION: The expected outcome after successful conversion from our current paper-based system to an online ADE reporting system would be increased ADE reporting through greater accessibility and ease of use. A more user-friendly system would also help to facilitate multidisciplinary participation in ADE reporting. A future consideration after completing this project would be to expand participation in ADE reporting to affiliated outpatient clinics.

Learning Objectives:

To understand the importance of developing a systematic design plan prior to creating and implementing new software technology.

To recognize how incorporation of new software technology can positively impact ADE reporting statistics.

Self Assessment Questions:

List three essential components of an ideal ADE reporting system.

TRUE OR FALSE One of the advantages of creating an online ADE reporting system would be decreased multidisciplinary involvement in ADE reporting.

EVALUATION OF PATIENT RISKS ASSOCIATED WITH CONCURRENT USE OF LINEZOLID WITH SEROTONIN REUPTAKE INHIBITORS

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Background/Objectives: Linezolid, an oxazolidinone derivative antibiotic used in the treatment of resistant infections, is a relatively weak (Ki = 55µm), reversible, selective inhibitor of MAO-A, the MAO isoenzyme responsible for the metabolism of serotonin. Current medical literature contains 10 case reports describing 12 cases of suspected serotonin-mediated adverse drug events associated with concurrent use of linezolid with serotonin reuptake inhibitors (SRIs), (e.g. citalopram, fluoxetine, paroxetine, sertraline, venlafaxine) as well as mirtazapine.

The purpose of this study is to identify and report the incidence, severity, and risk factors for adverse drug events associated with concurrent use of linezolid with an SRI at our institution.

Methods: This study is a retrospective chart review of patients admitted to any service (7/1/00 – 12/31/05) that received an SRI (citalopram, fluoxetine, nefazodone, paroxetine, sertraline, venlafaxine) concurrent with linezolid. Patients less than 18 years of age and prisoners were excluded. Information collected included: age, sex, medical co-morbidities, home medications, medications received during admission, and documentation of new onset serotonin-mediated side effects or treatment of suspected serotonin syndrome. Documented symptoms were evaluated to determine if the event met criteria for discontinuation syndrome, mild to moderate serotonin side effects, or serotonin syndrome as determined by the Hunter Serotonin Toxicity Criteria and the Sternbach Criteria in the form of the serotonin syndrome scale. The Naranjo, et al. probability scale was used to assess likelihood of causal relationship.

Results/Conclusions: An initial evaluation of 30 patients on concurrent therapy produced no evidence of serotonin syndrome given the prescribed SRI doses (citalopram 10-40mg, fluoxetine 40mg, paroxetine 20-60mg, sertraline 20-100mg, venlafaxine 75-150mg) and lengths of concurrent therapy (average 9.2 days). Evidence of discontinuation syndrome was absent in 2 patients whose therapy was discontinued immediately prior to beginning linezolid.

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

Learning Objectives:

Become familiar with the characteristic symptoms of serotonin syndrome.

Consider the risks and benefits associated with continuing concurrent SRI antidepressant therapy with linezolid.

Self Assessment Questions:

Each of the following symptoms are typically associated with serotonin syndrome EXCEPT:
a. Myoclonus
b. Fever
c. Hyporeflexia
d. Confusion
e. Ataxia

Which of the following symptom(s) may be seen in the SRI discontinuation syndrome?
a. Irritability
b. Paraesthesia
c. Vivid dreaming
d. Flu-like symptoms
e. All of the above

A RETROSPECTIVE EVALUATION OF THE EFFECT OF RECENTLY-DIAGNOSED DEPRESSION ON GLYCEMIC CONTROL IN DIABETIC VA PATIENTS

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Purpose

Approximately 20.8 million people in the United States have diabetes. Patients with diabetes are at risk for developing macrovascular and microvascular complications, including peripheral vascular disease, cerebrovascular disease, retinopathy, nephropathy, and neuropathy, due to poor glycemic control. Multiple studies have shown that patients with diabetes have a higher prevalence of depression when compared with the general population. Depression is a costly comorbidity of diabetes; proper treatment and disease management can control excess costs. The purpose of this study is to determine the effect of depression on diabetes control in patients treated at the Jesse Brown Veterans Affairs Medical Center (JBVAMC).

Methods

This research project is a retrospective chart review of 200 patients at the JBVAMC who were treated for diabetes and initiated treatment for depression between January 1, 2003 and June 30, 2005. The primary endpoint will be the effect of antidepressant treatment for depression on patients' glycosylated hemoglobin A1c (A1c) compared to baseline. Secondary endpoints will include: clinic appointment compliance, the relationship between A1c and the clinic(s) responsible for depression and diabetes care, the effect of concurrent therapy with other glycemic-altering medications on A1c control, the effect of comorbid psychiatric illnesses on A1c control, and the relationship between A1c and various antidepressants.

Results and Conclusions

The results and conclusions of this project will be presented at the Great Lakes Residency Conference.

Learning Objectives:

Identify the effect of depression on diabetes control in patients at the JBVAMC.

Recognize the need to manage all concomitant disease states for optimal patient health.

Self Assessment Questions:

True or False: It is important to manage all concomitant disease states in diabetic patients to ensure diabetic control.

True or False: The prevalence of depression is greater in diabetic patients compared to the general population.

EVALUATION OF OSTEOPOROSIS IN PROSTATE CANCER PATIENTS ON ANDROGEN DEPRIVATION THERAPY

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Background:

Prostate cancer is the most commonly diagnosed cancer, with 250,000 new cases reported annually. Prostate cancer is also the 2nd leading cause of death in men in the United States. Current prostate cancer treatments include radiation, prostectomy and androgen deprivation therapy (ADT), which includes chemical, such as gonadatropin-releasing hormone agonists (GnRH-a), or surgical hormonal deprivation, such as orchiectomy. One of the side effects of ADT is osteoporosis. Osteoporosis itself is a leading cause of morbidity and mortality in the elderly population. Most studies regarding osteoporosis have been limited to studies in women. Although osteoporosis in men has been historically under-diagnosed and overlooked, there are currently 1.5 million men greater then 65 years old with osteoporosis, with 3.5 million men at risk. Complications of osteoporosis may be delayed and prevented via screening and treatment.

Purpose:

The purpose of this retrospective study is to evaluate osteoporosis in men with prostate cancer on hormonal deprivation therapy.

Methods:

This retrospective study examines the Jesse Brown VA Medical Center prostate cancer patients on androgen deprivation therapy. Subjects were included if they received ADT via orchiectomy or GnRH-a (Goserelin). A computerized list of all patients on Goserelin between January 1, 1995 and October 31, 2005 was generated. A report of all orchiectomy patients between this time frame was generated to include patients on surgical hormonal deprivation.

Results/Conclusion:

Data collection is currently in process. All results and conclusions will be presented at the conference.

Learning Objectives:

Discuss the prevalence and incidence of osteoporosis in men.

Discuss and promote monitoring parameters regarding osteoporosis for men on androgen deprivation therapy.

Self Assessment Questions:

Androgen deprivation therapy does not induce osteoporosis. T or F

Prostate cancer patients on androgen deprivation therapy should have a baseline bone mineral density. T or F

INCIDENCE OF ANXIETY AND DEPRESSION IN VA CHICAGO HEPATITIS C PATIENTS AT THEIR INITIAL VISIT TO THE HEPATITIS C CLINIC

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Background:
Hepatitis C viral (HCV) infection is a potentially fatal disease with several complications. The Veterans Affairs Hepatitis C prevalence study of 2004 found that approximately 5.4% of veterans who are in Veterans Health Administration care are infected with hepatitis C. Symptom experience, stigma and uncertainty about this infection may lead to depression and anxiety in individuals diagnosed with HCV.

The purpose of this study is to investigate the incidence of anxiety and depression in the hepatitis C patient population within the Jesse Brown VA Medical Center upon their initial visit to Hepatitis C clinic. Proper patient assessment may enable practitioners to be more alert in recognizing possible depression and/or anxiety in patients with Hepatitis C and may aid in any future interventions.

Methodology:
In this retrospective chart review study, patients must be: 18 years of age or older with a diagnosis of hepatitis C infection and properly complete the Hospital Anxiety and Depression (HADS) questionnaire administered during the initial visit to the hepatitis C clinic. HADS will be the monitoring tool in this study for detecting the presence of anxiety and/or depression. All patients who completed the HADS between January 1, 2002 and September 30, 2005 will be included in the study. An electronic chart review of the following data will be collected: age, gender, race, lime lapse between diagnosis and clinic visit, past medical history, employment status, social history, appointment history and history of military service.

Results/Conclusions:
To be presented at the Great Lakes Residency Conference.

Learning Objectives:

To identify the incidence of anxiety and depression in the veteran population with hepatitis C within the VA Chicago Health Care Systems upon their initial visit to the hepatitis C clinic.

To enable practitioners to be more alert in recognizing possible depression and/or anxiety in patients with Hepatitis C within the VA Chicago Health Care Systems.

Self Assessment Questions:

True/false: Hepatitis C can be prevented by vaccination.

True/false: You can have a normal liver enzyme (e.g. ALT) and still have chronic hepatitis C.

EVALUATION OF AMIODARONE TOXICITY MONITORING PRACTICES AT A VA FACILITY

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Purpose: Amiodarone is widely accepted as an effective anti-arrhythmic agent, yet its use is associated with the risk for many toxicities. The purpose of this project is to assess the amiodarone toxicity monitoring practices performed at the Milwaukee VA facility, and also to determine if any toxicities have occurred in patients taking this medication.

Methods: Prior to commencement, the study was submitted to the Institutional Review Board for approval. Patients with active prescriptions for amiodarone were then identified using the computerized patient record system. A retrospective, year-long, chart review will be performed for patients currently receiving amiodarone. Those being followed by outside cardiologists, or those who have not been taking amiodarone for at least one year will be excluded from the study. The primary outcome measure consists of the presence or absence of appropriate monitoring parameters as defined by the North American Society of Pacing and Electrophysiology, including: pulmonary function tests, chest x-ray, thyroid panel, liver panel, electrocardiogram, and clinical evaluation. As a secondary outcome measure, adverse events due to amiodarone will be documented. If necessary, a subsequent part of the project will include creating computerized clinical reminders to ensure appropriate monitoring is completed for all amiodarone patients in the future.

Results/Conclusions: To date, data has been collected for 60 qualifying patients. Preliminary results show that only about 72% of the appropriate amiodarone toxicity monitoring indicators are currently being performed. Five toxicities related to amiodarone therapy have also been identified. This information suggests that the Milwaukee VA facility may benefit from the development of a method to improve amiodarone toxicity monitoring practices.

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

Learning Objectives:

Discuss the common toxicities associated with amiodarone therapy.

Describe the appropriate toxicity monitoring parameters for patients on amiodarone therapy.

Self Assessment Questions:

TRUE or FALSE: Pulmonary toxicity associated with amiodarone therapy is dose-related.

The following amiodarone toxicity monitoring parameter(s) should be performed at least every six months of therapy:
a) Pulmonary function tests or chest X-ray
b) Electrocardiogram
c) Thyroid function tests
d) Serum creatinine and electrolytes
e) All of the above

PREVALENCE AND MANAGEMENT OF CHRONIC KIDNEY DISEASE AND ITS RISK FACTORS IN PATIENTS WITH DIABETES IN A PRIMARY CARE SETTING

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Objectives: We are developing a collaborative patient care program at the Rardin Family Practice Center, an academic primary care clinic. One goal is to improve identification and management of patients with chronic kidney disease (CKD) and its associated major risk factors. The objective of this particular project is to characterize the baseline prevalence of CKD and quality of care provided for CKD and its associated risk factors in our diabetic patients prior to initiation of the program.

Methods: We performed a retrospective chart review of all 707 diabetic patients > 13 years of age who were being actively managed at Rardin Family Practice Center as of June 30, 2004. Demographic data [age, race, height, weight], type of diabetes, smoking status, blood pressures, laboratory data [serum creatinine, BUN, hemoglobin A1c, lipids, and urinalyses for microalbuminuria/proteinuria], and medication use [antidiabetic, lipid-lowering, and antihypertensive drugs and aspirin] were collected and entered into a database (Filemaker Pro). Glomerular filtration rate will be estimated using the abbreviated Modification of Diet in Renal Disease equation, and the presence of CKD will be determined according to National Kidney Foundation guidelines. CKD prevalence will be characterized by determining the proportion of patients with CKD (overall and by stage), the proportion without CKD, and the proportion for whom CKD presence or absence could not be determined. Quality of care provided for CKD and its associated risk factors will be characterized by determining the proportion of patients achieving relevant goals according to National Kidney Foundation, American Diabetes Association, and JNC 7 guidelines. Achievement of hemoglobin A1c, blood pressure, and lipid goals; appropriate use of ACE-inhibitors, ARBs, and aspirin; and smoking cessation will be assessed. SPSS will be used for all data analyses.

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

Learning Objectives:

Describe the prevalence of CKD in the diabetic patient population in this study.

Characterize the quality of care provided for CKD and its risk factors in the diabetic patient population in this study.

Self Assessment Questions:

What was the overall prevalence of identifiable CKD in the diabetic patient population in this study?

What proportion of diabetic patients with CKD in this study achieved the hemoglobin A1c, blood pressure, and ACE-inhibitor/ARB treatment goals?

MEDICATION THERAPY MANAGEMENT SERVICES FOR A NON-MEDICARE POPULATION: SHORT-TERM ASSESSMENT OF ECONOMIC, CLINICAL, HUMANISTIC, AND PROCESS OUTCOMES

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OBJECTIVE
This project will show initial economic, clinical, humanistic, and process outcomes of medication reviews performed by pharmacists and student pharmacists working in collaboration with a private insurer.

METHODS
This is a Medication Therapy Management-type service for non-Medicare patients covered by a single private insurer. Through this project, medication reviews will be conducted at two branch campuses of an academic institution and at a medical clinic for faculty and staff of that same institution. Prior to initiating the reviews, physicians will be contacted to familiarize them with the program and to encourage collaboration. Patients will be able to self-request a medication review, or their physician may refer them into our service. During the reviews, patients will be asked about current use of prescription medications and nonprescription medications and supplements. Pharmacists and student pharmacists under pharmacist supervision will perform the service. Summaries of the reviews with recommendations for drug therapy will be sent to patients and their physicians. Patients and physicians will receive surveys to assess satisfaction with the service approximately three months after the reviews.

RESULTS
Short-term economic outcomes will be medication cost savings to the patient as well as medication cost savings to the insurer. Clinical outcomes will be the number and type of drug therapy problems identified. Humanistic measures will be assessed using patient and physician satisfaction surveys. Process outcomes will be the training and assessment of student pharmacist performance. We will also determine whether medication reviews are more beneficial when self-selected by the patient or when a patient is identified by their physician and referred.

CONCLUSION
We anticipate that the short-term outcomes described above will provide benefit for all parties involved. These benefits may help to justify implementation of a service for which pharmacists can be reimbursed.

Learning Objectives:

Realize the potential impact of pharmacist-performed medication reviews for individual patients, as well as for aggregate groups of patients covered by a single insurance provider

Consider active student pharmacist learning in a progressive clinical setting

Self Assessment Questions:

It is possible that medication reviews performed by pharmacists could result in increased medication costs for the patient and/or insurer. True/False

Over-the-counter medications and supplements do not substantially contribute to patient medication use and drug therapy problems. True/False

EVALUATION OF FORMAL TEACHING INSTRUCTION OF PHARMACY CLERKSHIP PRECEPTORS

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Background Information
Currently there are ninety-one colleges and schools of pharmacy with accredited pharmacy programs. The American Association of Colleges of Pharmacy (AACP) has noted a consecutive rise in professional pharmacy student enrollment averaging 4.68% per class over the past five years. In 2002, 7,573 pharmacists graduated from these accredited schools of pharmacy. By the year 2008, the number of graduates per year is projected to be 10,437. This increase in student enrollment will increase demand for qualified pharmacy clerkship preceptors.

Purpose
To evaluate the formal teaching instruction of pharmacy clerkship preceptors and to create a web-based training program of self-instructed modules on key learning topics for preceptors.

Methods
A survey inquiring about formal training on teaching instruction was created. This survey was sent to all preceptors affiliated with Butler University School of Pharmacy and Purdue University School of Pharmacy and Pharmaceutical Sciences. The survey will collect basic demographic data in addition to the following areas of formal training that the preceptor may have received:

Motivating students to learn
Understanding different teaching methodologies
Teaching by objectives
Using discussion in the learning process
Building student-teacher relationships
Precepting clerkship students
Incorporating feedback for improvement of teaching
Precepting pharmacy residents

All data will be recorded without preceptor identifiers and maintained confidentially. This information will be compiled, analyzed, and presented using descriptive statistics.

A website will be created for clerkship preceptors to obtain training in the key areas assessed by the electronic survey. Seminars that are currently provided by the Indianapolis Pharmacy Resident Teaching Certificate Program will be videotaped and posted on the newly created website as real-media files in the form of self-learning modules including seminar handouts, key resources, and post-test questions. Two Accreditation Counsel for Pharmacy Education (ACPE) credits will be acknowledged upon completion of each course module and the required test.

Learning Objectives:

Identify the need for provision of formal education to pharmacy clerkship preceptors.

Recognize the value in a web based teaching program with self instructed teaching modules.

Self Assessment Questions:

True or False: Clerkship preceptors would be interested in formal teaching instruction in self learn web based modules.

True or False: Pharmacy student enrollment and graduation rates are steadily on the rise which will increase the need for qualified clerkship preceptors.

EVALUATION OF THE USE OF ATROPINE 1% OPHTHALMIC SOLUTION ADMINISTERED SUBLINGUALLY FOR MANAGEMENT OF TERMINAL RESPIRATORY SECRETIONS

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Objective: Terminal respiratory secretions (TRS) or “death rattle” is a relatively common symptom in the dying patient. Current practice for the prevention and treatment of terminal respiratory secretions involves the use of anticholinergic drugs. The objective of this study is to review and evaluate the sublingual administration of atropine 1% ophthalmic solution for the management of terminal respiratory secretions at an inpatient hospice unit.

Methodology: Approval for this study is pending with the Institutional Review Board. A retrospective chart review of all patients admitted to an inpatient hospice unit in Columbus, Ohio for terminal care during the time period June 1, 2005 through December 31, 2005 will be conducted. All patients admitted for terminal care, or converted to terminal care during the course of an acute or respite admission that were treated with atropine for TRS will be studied. During chart review, a data collection tool will be used to track symptom management for those patients that developed TRS. The main outcome measure is the response of TRS symptom to the administration of atropine: resolution, improvement, or no change. Additional outcome measures will include heart rate, respiratory rate and presence of terminal restlessness. All data collected will be recorded without patient identifiers to maintain confidentiality.

As there have been no published studies evaluating the use of atropine 1% ophthalmic drops for the management of TRS, results of this study will be a significant addition to the palliative care literature. Benefits to family and caregivers of dying patients will potentially be reduced distress from TRS via a relatively non-invasive intervention. Results from the study should also benefit hospice programs who are seeking guidance and support on the management of TRS with atropine 1% ophthalmic drops as an easy to use and cost-effective alternate to other agents.

Learning Objectives:

Define the role of anticholinergic medications for management of terminal respiratory secretions.

Recoginze the importance of appropriate symptom management for patients in the terminal phase of their illness.

Self Assessment Questions:

Define and describe terminal respiratory tract secretions

List medications used to manage terminal respitory tract secretions that do not cross the blood-brain barrier

USE OF VASOPRESSORS AND INOTROPES IN NEONATAL INTENSIVE CARE UNIT PATIENTS UNDERGOING SURGICAL LIGATION OF PATENT DUCTUS ARTERIOSUS

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Patent ductus arteriosus (PDA) is the second most common congenital heart disorder. Infants with clinically significant PDA that does not close within the first few weeks of life, either spontaneously or pharmacologically, are possible candidates for surgical ligation. The pathophysiology of hypotension after PDA ligation is not well defined, but it is thought to be due in part to myocardial dysfunction. Effective treatment of hypotension and improved cardiovascular function and stability increases the likelihood of improved outcomes and survival in infants. If optimal pharmacologic cardiovascular support can be determined and utilized in these patients, the incidence of long-term sequelae may be diminished.

Methods: Medical charts of patients admitted to the Regional Center for Newborn Intensive Care (RCNIC) at Cincinnati Children's Hospital Medical Center who underwent surgical ligation of PDA between January 1, 2003 and December 31, 2005 were retrospectively reviewed. Data collected include patient demographics, survival to discharge, incidence of renal failure, medication use throughout hospitalization, maternal steroid use, diagnoses other than PDA, time from diagnosis to ligation, patient characteristics at birth and time of ligation, surgical procedure information, hours on mechanical ventilation, and days to begin enteral feeds post-operatively.

Preliminary results: To date, 33 patients have been evaluated. 7 patients received dobutamine, and 21 patients received vasopressors (dopamine, epinephrine, or both). Thirty patients survived to discharge. Further data collection and analysis are currently underway.

Conclusions: By identifying trends and factors associated with outcomes in this patient population, practitioners will be able to better identify patients who may require more intensive medical management prior to surgical PDA ligation and treat these patients accordingly. The information obtained in this investigation may also contribute to improvement of consistency related to medical management of these patients.

Learning Objectives:

Describe the significance of hypotension in neonatal patients after ligation of PDA.

Discuss the implications of the use of vasopressors and inotropes in patients who undergo surgical PDA ligation.

Self Assessment Questions:

T F Symptomatic PDA is associated with congestive heart failure and bronchopulmonary dysplasia.

T F Hypotension is uncommon after surgical procedures in neonates.

ERROR ANALYSIS USING AUTOMATED DISPENSING MACHINE OVERRIDE FUNCTIONALITY IN AN ADULT ACUTE CARE FACILITY

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Purpose:
The purpose of this project is to evaluate the medication error rate associated with using override function when removing propoxyphene/acetaminophen, determine if an intervention will decrease the error rate, assess the appropriateness of this medication in the elderly, and analyze the override medication categories through a multi-disciplinary committee.

Methods: A computer-generated report identified 90 occurrences of override function use from an automated dispensing machine during the removal of propoxyphene/acetaminophen in July 2005. Actual and potential medication errors and patient demographics were determined through retrospective chart review. Actual medication errors assessed were: wrong dose, wrong administration frequency, allergy to opioid or acetaminophen, and no written order. Potential errors assessed were: acetaminophen greater than 4 grams in 24 hours, age greater than 65 years (Beer's criteria), and repeated dosing without pharmacist order review. Error rates were compared pre and post intervention. An intervention aimed at reducing medication errors was developed and nurses were educated on appropriate override use. The intervention included: (1) an actionable alert on the automated dispensing machine screen that required nursing to document a reason for override removal and (2) a reminder of the maximum daily dose for acetaminophen. The intervention was studied in orthopedic floors for two months prior to implementing on all adult inpatient floors. Collaboration with nursing is under development to evaluate the medication override categories.

Results: The pre-intervention results showed an actual error rate of 26/90 (29%). The most frequent error was wrong administration frequency. The potential error rate was 43/90 (48%). The majority of potential errors were inappropriate use in the elderly according to the Beer's criteria. Post-intervention results will be presented at the conference.

Preliminary Conclusions: The use of override function can be associated with medication errors.

Learning Objectives:

Identify the potential medication safety concerns with the use of override function.

Describe a strategy to decrease medication errors related to overrides.

Self Assessment Questions:

Medication errors do not occur because of override function. T or F

There are no safety issues with using propoxyphene/acetaminophen in the elderly. T or F

EVALUATION OF NEPHROTOXICITY IN PATIENTS RECEIVING INTRAVENOUS ACYCLOVIR

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The incidence of acyclovir-induced nephrotoxicity cited in the literature can range from 12-48%. Several risk factors for developing drug-induced nephrotoxicity have been identified. When multiple risk factors are present, the risk of developing drug-induced nephrotoxicity increases. With an unpredictable incidence and numerous risk factors associated with this condition, the objective of this study is to determine the incidence of acyclovir-induced nephrotoxicity at The Ohio State University Medical Center and to identify the predominant risk factors present in patients who develop acyclovir-induced nephrotoxicity.

A retrospective chart review is being conducted including 300 patients that received intravenous acyclovir from January 2001 to January 2005. The proposal for this review has been approved by the investigational review board at The Ohio State University Medical Center. Patients included received intravenous acyclovir within the specified time frame. Patients less than 18 years of age, >89 years of age, with end stage renal disease, and/or with acute renal failure upon initiation of therapy are excluded from the review. Nephrotoxicity is defined as an increase in serum creatinine greater than 0.3 milligrams per deciliter within five days after initiation of acyclovir. Data collected include demographics, dose, serum creatinine and creatinine clearance, presence of predefined risk factors for developing drug-induced nephrotoxicity, urinalysis results, time to the development of nephrotoxicity, and measures taken when patients developed nephrotoxicity. The outcomes evaluated include the incidence of nephrotoxicity and the risk factors present in patients who develop nephrotoxicity. The predominant risk factors present will be compared to those present in patients who did not develop nephrotoxicity with acyclovir administration. To date, 232 patients have been reviewed. The preliminary results indicate a 16.8% incidence of acyclovir-induced nephrotoxicity at our institution. The predominant risk factors identified in patients developing nephrotoxicity include male gender, concomitant use of nephrotoxins, diabetes, and diuretic use.

Learning Objectives:

Understand the mechanisms by which acyclovir-induced nephrotoxicity may occur

Identify the predominant risk factors associated with acyclovir-induced nephrotoxicity

Self Assessment Questions:

Female gender is an identified risk factor for drug-induced nephrotoxicity. T or F

The incidence of acyclovir-induced nephrotoxicity cited in the literature is <10%. T or F

ASSESSMENT OF BASELINE COMPLIANCE WITH THE ASHP HEALTH-SYSTEM PHARMACY 2015 INITIATIVE GOALS AND OBJECTIVES

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Purpose:
The American Society of Health-System Pharmacists (ASHP) developed future goals and objectives aimed at expanding the framework of pharmacy practice for the purpose of improving medication efficacy and safety. An assessment of baseline compliance with the ASHP 2015 Initiative goals and objectives at the thirteen hospitals and associated clinic based pharmacy practices of Aurora Health Care will provide guidance for strategizing and prioritizing future improvement measures.

Methods:
The ASHP 2015 Initiative goals and objectives were reviewed, clarified, and defined with guidance from ASHP. A survey was used to assess compliance with each of the applicable thirty-one 2015 Initiative objectives. The survey was distributed and collected from November 2005 – December 2005 through the online service SurveyMonkey(TM), www.surveymonkey.com. Representatives from each pharmacy department of the thirteen hospitals within the Aurora Health Care system were provided with verbal and written instructions and guidance for the completion of the survey. Results were compiled, organized, and discussed with a local ASHP Initiative workgroup. Based on the data from this baseline analysis, the workgroup selected and focused on improvement efforts within the various pharmacy departments of Aurora Health Care.

Results/Conclusions:
Results will be presented to the system-wide pharmacy group and processes for improvement will be recommended as needed.

Learning Objectives:

Assessment of baseline compliance with the ASHP 2015 Initiative goals and objectives at the thirteen hospitals and associated clinic based pharmacy practices of Aurora Health Care

Analyze data to guide in prioritizing and strategizing future improvement measures

Self Assessment Questions:

True/False The ASHP 2015 Initiative is aimed at expanding the framework of pharmacy practice for the purpose of improving medication efficacy and safety.

True/False An objective of the 2015 Initiative is encouraging pharmacy departments to ensure that hospitalized patients with an acute myocardial infarction receive an angiotensin-converting enzyme inhibitors/angiotensin receptor blockers, beta-blockers, aspirin, or lipid lowering therapy at discharge.

IMPACT OF A COMMUNITY PHARMACIST INTERVENTION ON CARDIOVASCULAR GOAL ATTAINMENT AND MEDICATION ADHERENCE

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Purpose: Challenges exist in the management of cardiovascular disease. Less then half of patients for whom lipid lowering therapy is indicated receive treatment. Of those, only one third, achieve their LDL cholesterol goal. Further, only 34% of hypertensive patients are at goal. Medication nonadherence remains a significant problem. Pharmacists performing direct patient care interventions have demonstrated effectiveness in improving medication adherence. The goal of this project is to improve cardiovascular goal attainment and medication adherence through one of two pharmacist-based interventions.

Methods: Following IRB approval, and patient consent, patients from a family practice clinic with hypertension and/or hyperlipidemia were identified based on ICD-9 coding and chart review. Coronary heart disease (CHD) goal attainment for blood pressure and cholesterol were determined based on national guidelines. Patients not currently at either goal were randomly placed into one of two intervention groups and met with the community pharmacist at their next scheduled physician appointment in the clinic. Intervention groups differed based on the intensity of patient education, with one group receiving conventional counseling and the second group receiving the conventional intervention augmented with the utilization of the CHD v8 software. Both groups were educated on their blood pressure and/or lipid goals, received medication diaries, and completed a Morisky questionnaire and readiness instrument to assess adherence and readiness for change. The pharmacist followed-up with the patients at 30 days and three months to assess progress toward goal attainment and medication adherence, via pill counts. Repeat blood pressure and lipid levels, and a repeat of all baseline measures were also be obtained.

Results: To date 225 patient charts were reviewed identifying 101 patients eligible. Preliminary results along with intervention progress will be presented.

Conclusion: Results will be used to evaluate the impact of a community pharmacist intervention on cardiovascular goal attainment and medication adherence.

Learning Objectives:

Identify various mechanisms that may be used to assist patients with medication adherence.

Discuss the impact and the significance of medication adherence as it relates to goal attainment.

Self Assessment Questions:

It is valuable to assess medication adherence when looking at cardiovascular goal attainment (T/F)

Adherence is a multifaceted problem involving the patient, physician, pharmacist, as well as other members of the health care team. (T/F)

WOMEN'S HEALTH SERVICES IN A COMMUNITY PHARMACY: CARDIOVASCULAR HEALTH MANAGEMENT

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Background:
According to the American Heart Association, cardiovascular disease is the leading cause of death in women. 44% of women die within the first year following a heart attack, compared to 25% of men. Community pharmacists are a great resource for women with risk factors for cardiovascular disease, because they are able to offer point of care counseling and disease state monitoring.

Purpose:
To (1) increase women's awareness of cardiovascular disease and personal risk factors and (2) assess patient satisfaction with a new clinical program in a community pharmacy setting.

Methods:
Pharmacists will identify at-risk patients through new prescriptions and refills for medications indicating increased risk for heart disease, and through a Women's Heart Disease Awareness in-store event. The Women's Cardiovascular Health Management Service will be offered to women who meet inclusion criteria (over the age of 20 and 1 or more risk factors for heart disease), and barring any exclusion criteria (pregnancy, substance abuse, non-English speaking).

Patients will receive a 30-45 minute consultation with the pharmacist, which includes a fasting lipid panel, blood glucose, blood pressure, body mass index measurement, risk and lifestyle assessment, and pre-test. Recommendations will be made to the primary care physician when indicated.

Patients will be referred to a group counseling session to take place 2 weeks after the initial screening, which will consist of education about heart disease, life-style modifications, and medication adherence. A post-session will take place 2 weeks after the group session, and will include a blood pressure and BMI re-check. The second post session will take place 2 weeks later, and will include a repeat of the initial screenings and post-test. A review of current medications and adherence will take place during both post-sessions. Patients will be asked to complete a mail survey one month after program completion.

Results/Conclusions: In progress

Learning Objectives:

Discuss the importance of assessing cardiovascular disease risk factors in women.

Discuss strategies for increasing women's awareness of cardiovascular disease risk factors.

Self Assessment Questions:

A majority of women consider themselves to be very well informed about heart disease. T/F

Women are more likely than men to experience “typical” symptoms of heart disease. T/F

MEDICATION THERAPY MANAGEMENT (MTM) PILOT PROGRAM: EVALUATING THE EFFECTIVENESS OF FACE-TO-FACE PHARMACIST CONSULTATIONS IN A MEDICARE MTM ELIGIBLE POPULATION

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Purpose: To assess the face-to-face pharmacist consultation component of MTM involving community pharmacists and potential Medicare beneficiaries.

Methods: Community pharmacists will manage the medication therapy of Medicare Advantage (MA) beneficiaries in the Chicago area that meet the criteria of 2 chronic conditions, 8 chronic, systemic Part D medications, and an anticipated medication cost of over $4000 per calendar year. During the MTM services, the pharmacist will identify areas for medication improvement, provide education/counseling to the beneficiaries, perform drug safety check, review all medication records, review of compliance, identify issues of over and under utilization, address issues of cost constraints, evaluate the appropriateness of therapy, and perform CLIA-waived lab tests and/or surveys in order to ensure optimization of their drug therapy (when appropriate). After 1 month of medication therapy management services, enrollment and patient satisfaction data will be analyzed. After 6 months and 12 months, medication possession ratio and utilization data will be analyzed to determine the impact that MTM services has had on adherence. A university group will analyze the information gathered to determine ways to improve behavior patterns within this population.

Results/Conclusions: A total of 435 beneficiaries were eligible based on eligibility criteria. 71 (15.9%) MTM consultations have been scheduled. There were several reasons why beneficiaries declined the MTM consultation services: Not Interested (20%), MD/Caregiver Manages Medications (7%), Distance/ Transportation Issues (9%), WCB/ Requested Later Call (27%), Language Barrier (2%), and Other (35%).
36 (50.7%) beneficiaries completed a patient satisfaction survey. Survey results showed 66% of respondents would strongly recommend MTM consultation services to others and 64% discussed potential medication problems with the pharmacist and will share them with their physician. Data collection is still in progress.

Learning Objectives:

Determine behavior patterns of a Medicare eligible population

Project 2006 MTM face-to-face consultation statistics

Self Assessment Questions:

The Centers for Medicare & Medicaid Services has clearly defined how a MTM program should be structured? T or F

Which healthcare professional is specifically mentioned in the statutory language to provide MTM services?

COMPARISON OF OCTREOTIDE VERSUS OCTREOTIDE AND CONTINUOUS INFUSION PANTOPRAZOLE IN THE TREATMENT OF VARICEAL HEMORRHAGE

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Background/Objectives:
Twenty five to thirty five percent of patients with cirrhosis develop variceal bleeding and as many as 30 percent of the initial episodes are fatal. Treatment recommendations for controlling active bleed include initiating intravenous octreotide continued for 3 or 5 days with urgent endoscopic therapy (sclerotherapy or band ligation). Continuous infusion proton pump inhibitor (PPI) therapy has been shown to be effective in the management of bleeding peptic ulcers but has not been evaluated in the management of acute variceal bleed. We are conducting a study to examine if the addition of pantoprazole to octreotide improves outcome compared to octreotide monotherapy.

The primary objective of this study is to compare octreotide therapy with the combination of octreotide and pantoprazole therapy with respect to control of bleeding in adult patients with acute variceal hemorrhage.

Methods:
A retrospective review will be conducted of patients who were hospitalized for acute variceal hemorrhage. The control group consists of approximately 220 patients treated with octreotide alone and the combination group includes approximately 120 patients treated with octreotide plus high dose continuous infusion of pantoprazole. All the data will be obtained from admissions from January 2003 through June 2005. Parameters collected include demographics and baseline characteristics, hospital and ICU length of stay, mortality, significant medical history, laboratory data, PPI dose and duration, octreotide dose and duration, number of bleeds, number of endoscopic procedures, and the number of blood, plasma, or plasma substitute transfusions.

Results:
Data collection is in progress. Results comparing the clinical parameters between the two groups will be presented.

Learning Objectives:

Review literature on efficacy and safety of octreotide in the treatment of acute variceal hemorrhage.

To understand the potential clinical impact of adding pantoprazole to octreotide for the treatment of acute variceal hemorrhage.

Self Assessment Questions:

T/F. Pantoprazole has been shown to have therapeutic efficacy in the treatment of acute variceal hemorrhage.

Which of the following pharmacologic agents are used in the treatment of acute variceal hemorrhage in the U.S.?
a. Octreotide
b. Terlipressin
c. Somastostatin
d. All of the above

IMPACT OF AND COMPLIANCE WITH A PROTOCOL FOR THE USE OF RECOMBINANT FACTOR VIIA.

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Background/Objectives:
Due to the growing off-label uses of recombinant factor VIIa (rFVIIa) at the University of Michigan Hospitals, there was a need to develop guidelines and implement restrictions in assuring appropriate utilization. With the implementation of the protocol, the impact was unknown. The objectives of this study are to evaluate the appropriateness of rFVIIa use based on the University of Michigan Health System (UMHS) guidelines and to determine their impact via comparison of rFVIIa utilization before and after their implementation.

Methods:
Both a retrospective review of use over the previous 12 months and concurrent review of all cases after implementation of the guidelines will be performed for rFVIIa use in adults. A data collection form will be created which will include patient demographics, managing physician and service, indication for use, dose given, number of doses, and if a hematology service consult was obtained. Data will be collected on patients as far back as one year prior to and up to six months following the implementation of the protocol on October 2005. Data will be extracted from patient charts, medical records, and UMHS pharmacy dispensing system (Mediware WORx 2.8). Descriptive statistics and Chi Square tests will be performed on the appropriateness of use, pre- and post-implementation of the guidelines. Once all cases during this time period are reviewed and the appropriateness of rFVIIa of each patient is evaluated, a comparison of the impact of the protocol on rFVIIa use will be analyzed. Parameters to be assessed will include the percentage of cases meeting appropriate use criteria, appropriate dosing of rFVIIa, and the impact on overall utilization of the product.

Results:
Data collection is in progress. Results comparing rFVIIa use pre- and post-implementation of the UMHS guidelines will be presented.

Learning Objectives:

To identify the physiological functions and indications of recombinant factor VIIa.

To describe the study design and the University of Michigan Health System guidelines for recombinant factor VIIa utilization.

Self Assessment Questions:

T/F: The only FDA indication for recombinant factor VIIa is for the treatment of bleeding events in Hemophilia A or B patients.

Which of the following adverse effects has recently been stated as being a potential risk of occurring with the treatment in off-label indications in an FDA warning letter?
a. Thrombocytopenia
b. Renal dysfunction
c. Thromboembolism
d. Liver failure

IMPLEMENTATION OF ALGORITHMS AND PSYCHIATRIC RATING SCALES FOR TREATMENT OF PEDIATRIC BIPOLAR DISORDER (PBD)

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Background: The focus of this investigation is to study the feasibility and process of implementing algorithms for PBD. Algorithms or guidelines should be geared to produce assistance for physician to make more informed decisions, provide maximal symptom reduction and provide maximal functional recovery. The clinical assessment of the patients in this study is done by utilizing psychiatric rating scales. In today's psychiatric clinical practice, rating scales have come to play an ever-increasing role both in determining specific symptoms, diagnosing individual conditions, assessing improvements/deterioration of condition, and highlighting potential side effects of treatment. Rating scales can serve as checklists, and may provide information about the longitudinal course of a patient's illness
Objectives: To implement treatment algorithms for children and adolescent with bipolar –I disorder, manic or mixed without/with psychosis meeting the inclusion criteria and to evaluate the efficacy of these algorithms using the psychiatric rating scales.
Methods: The two algorithms consist of six different stages of treatment. Each patient is initiated at stage one of the treatment algorithm. Once the patient has been titrated to the optimal dose and has achieved desired serum concentration, the patient is assessed using the psychiatric rating scales for improvement in symptoms and for response to that stage of treatment. If the patient is non responsive, the treatment is changed to the next stage. The following psychiatric scales are used for the patient's assessment: The brief psychiatric rating scale; the clinical global impression scale-Bipolar; the Young mania rating scale and the Children's global assessment scale
Results/Conclusions: This study has been approved by Parkview Health Investigational Review Board. Data collection is in process. Results and conclusions of the study will be presented at the conference.

Learning Objectives:

To determine the feasibility of implementing algorithms for treatment of pediatric bipolar disorder

To determine the effectiveness of clinical assessment using psychiatric rating scales.

Self Assessment Questions:

Implementing the algorithm effected meaningful changes in patient symptomatic and functional outcomes T/F

The psychiatric rating scales can be used as an effective tool for measuring the patient's clinical response to a medication T/F

ASSESSING EDUCATIONAL TOOLS IN HEART FAILURE PATIENTS FROM PHARMACIST-BASED MEDICATION TEACHING

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This is a randomized, controlled study assessing the impact of pharmacist interventions on patient's understanding of their medications. This study is waiting IRB approval.

Medications have been shown to reduce morbidity and mortality in heart failure patients. However, medication regimens may be complicated and the current hospital resources heart failure patients receive are not written at a level that is understood by patients with low health literacy. Health literacy is defined as a patient's ability to read, understand, and utilize healthcare information that allows them to make decisions and follow instructions for treatment. This barrier may result in patient non-adherence, leading to a possible increase in hospitalizations and poorer health outcomes.

Patients admitted to the telemetry unit with a new diagnosis of heart failure or an exacerbation of heart failure will be randomized to two groups. A series of study questions will be asked to both groups at baseline, post nurse/pharmacist discharge instructions, and one week after discharge with a telephone follow-up. The first group will be patients who receive routine care and no intervention from a pharmacist (N=22). The second group will receive routine care in addition to a consult by a pharmacist who will provide the patient with education materials and face-to-face counseling prior to discharge (N=22).

Patients included will be diagnosed with new onset heart failure or heart failure exacerbation with a left ventricular ejection fraction (LVEF) <40%. Patients will be excluded if they have a concurrent diagnosis of dementia, altered mental status, Alzheimer's Disease, or patients who speak English as a second language. The primary endpoint will be the patient's correct/incorrect verbalization of the indication of the medication and the dose. Secondary endpoints will include the patient's correct/incorrect verbalization of the medications frequency and side effect profile.

Learning Objectives:

To understand the definition and the importance of health literacy and its current impact on patient care.

To learn about various educational tools and materials for heart failure medications that can be understood by patients with low health literacy.

Self Assessment Questions:

T/F Health literacy is a patients ability to read healthcare information and follow instructions for treatment.

Is there increased patient understanding of their medication when a pharmacist provides inpatient medication counseling?

MANAGEMENT OF RESPIRATORY CULTURES IN A PEDIATRIC INTENSIVE CARE UNIT (PICU)

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Background:
The diagnosis of hospital-acquired pneumonia (HAP) in an intensive care unit is complicated by a high colonization rate and patients' unstable clinical presentations. The current American Thoracic Society and Infectious Diseases Society of America (IDSA) guidelines for the management of adults with hospital-acquired, ventilator-associated, and healthcare-associated pneumonia state that semi-quantitative cultures may not reliably differentiate true pathogens from colonizers, and may result in the use of more antimicrobials or broader spectrum antimicrobial therapy when compared to a quantitative approach. The guidelines also recommend that clinical presentation and bacteriologic data must be considered in the diagnosis of HAP.

At Children's Hospital of Michigan, the inappropriate use of antimicrobials for positive respiratory cultures without clinical suggestion of pneumonia has been observed via epidemiology surveillance data. We propose that an antimicrobial prescribing guideline based on a surveillance guideline published by Centers for Disease Control (CDC) and National Nosocomial Infections Surveillance (NNIS) may standardize prescribing by physicians to reduce the number of antimicrobial prescriptions in PICU patients with bacterial colonization and no other clinical symptoms to support the diagnosis of HAP.

Methods:
A retrospective chart-review study. The following data will be collected from the charts: Patient age, gender, primary service, timing, types and results of positive respiratory cultures, infectious diseases consult notes, pharmacist interventions, antimicrobial prescriptions, chest X-ray trends, signs and symptoms from a week prior to the administration of antimicrobial prescription, admission diagnosis, discharge diagnosis, and outcomes. Data will be applied to CDC/NNIS guideline to determine antimicrobial prescription appropriateness. Outcomes will be compared for patients managed by watchful waiting compared with patients who receive antimicrobials.

Purpose:
To determine the antimicrobial prescribing practice in response to positive respiratory cultures obtained in the PICU. Results will be used to implement guidelines and educate physicians on appropriate antimicrobial prescribing for positive respiratory cultures in this setting.

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

Learning Objectives:

Discuss challenges for positive respiratory culture interpretations and HAP diagnosis.

Describe the impact pharmacists can have on patient monitoring and antimicrobial management

Self Assessment Questions:

T/F Positive respiratory cultures obtained by tracheal aspiration should be carefully interpreted because tracheal colonization without true infection is very common in ICU.

T/F Tracheal colonization directly causes actual infection and may be easily eradicated. Current evidence-based guidelines recommend initiating systemic antimicrobial treatment as soon as a positive respiratory culture is obtained.

EVALUATION OF PRINT MEDIA AND MEDICATION SAFETY REPORTING

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Objective:
Media reports have become an important source of health and medication information for patients. The language of reports on medication safety is at times sensational and metaphors are used to deepen the impact on the reader. Knowledge and appreciation of the type of medication safety information that appears in mass media can aid drug information specialists in addressing patients' concerns and questions. The objective of this study is to evaluate media reports based on the type of safety issue, drug class, and the use of expert opinion and the use of metaphorical language in the text or headline.

Methodology:
A Lexis-Nexis search was performed of six major US publications: The New York Times, The Boston Globe, The Los Angeles Times, USA Today, The Wall Street Journal and The Chicago Sun Times. Articles published between March 2005 and September 2005 that contain terms “medicine and safety” or “medication and safety” were analyzed. Information was collected on the total number of articles, the presence of metaphorical language anywhere in the text or headline, the source of information, the specific focus of the report and the use of expert opinion. Examples of the use of metaphorical language to describe a medication safety issue were collected and evaluated.

Preliminary results:
88 articles were identified as reports with the focus on various themes of medication safety. 50 headlines were examined for the presence of metaphorical language and 30 reports were analyzed for content. Metaphors were found in 19 (38%) headlines.

Conclusions:
The preliminary results of this ongoing study reveal that medication safety is frequently scrutinized in the print media. Pharmacists must be cognizant of the types of information and messages about medications that patients receive in order to respond to potential questions from consumers.

Learning Objectives:

To present an analysis of medication safety issues in the mass media.

To discuss the importance of pharmacists' awareness of issues in the mass media related to medication safety.

Self Assessment Questions:

The headlines of reports dealing with medication safety issues include metaphorical language more often that those of the control sample. T or F

Keeping up with mass media reports on medication safety issues may be important for pharmacists in addressing patients' concerns. T or F

ORAL GENTAMICIN THERAPY AND THE INCIDENCE OF NECROTIZING ENTEROCOLITIS (NEC) IN VERY LOW BIRTH WEIGHT INFANTS: AN OBSERVATIONAL STUDY

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Purpose:
Advances in neonatology have lead to an increased survival of very low birth weight infants. This population is at increased risk of necrotizing enterocolitis (NEC). The incidence of NEC has been reported as high as 13% in this population1. Mechanisms of prevention are limited and controversial. One proposed mechanism of prevention is orally administered gentamicin therapy. This practice is standard of care by many physicians; however few clinical trials have evaluated the efficacy of oral gentimicin for NEC prophylaxis. The purpose of this observational study was to determine the incidence of NEC in patients who received oral gentamicin.
Methods:
A retrospective chart review was conducted of those patients who received oral gentamicin 2.5mg/kg/dose q8h between July 2005 and December 2005. Criteria for receiving oral gentamicin included those patients less than 32 weeks gestation or less than 1500 grams at birth. Oral gentamicin was continued until the patient reached goal enteral feeds. Data collection included birth weight, gestational age, sex, APGARs, duration of oral gentamicin, signs/symptoms of NEC, associated risk factors of NEC, and feeding schedule and titration.
Results:
Thirty-four charts were reviewed. Enteral feeds were initiated and titrated slowly. Of the 34 patients, one (2.9%) developed NEC after receiving oral gentamicin. One additional patient developed NEC before receiving oral gentamicin therapy. The average length of gentamicin therapy was 26 days. The average birth weight was 1251 gm. The average estimated gestational age was 30 weeks. Eighty-two percent of patients experienced apnea, bradycardia or desaturations; which are symptoms attributable to other neonatal pathologies. No adverse events were attributed to oral gentamicin therapy.
Conclusions:
Those patients receiving oral gentamicin had a lower incidence of NEC compared to the reported national incidence. The results of this study warrant further research on oral gentamicin for NEC prophylaxis.

Learning Objectives:

Determine which infants are at the greatest risk of developing NEC.

Explore the potential benefits of oral gentamicin for NEC prophylaxis in high risk infants.

Self Assessment Questions:

Which patients are most susceptible to the development of NEC?

_____ is a potential treatment modality for the prevention of NEC?

ASSESSMENT OF A MEDICARE DRUG BENEFIT CONSULT SERVICE

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The Medicare Prescription Drug, Improvement, and Modernization Act, known as Medicare Part D, was passed to establish drug coverage for Medicare beneficiaries beginning in 2006. This complex piece of legislation requires patients to bear the responsibility of choosing to receive their drug benefits from stand alone prescription drug plans (PDPs) or through private insurers called Medicare Advantage-Prescription Drug (MA-PD) organizations. With so many options to choose from, many beneficiaries will turn to their pharmacist for guidance during the initial enrollment process and for information regarding their coverage and drug spending throughout the year. A pharmacist consult service will be available at The University of Illinois Medical Center at Chicago to assist beneficiaries in identifying a plan that will suit their prescription drug needs.

This survey is designed to determine the effectiveness of a pharmacist consult service in educating Medicare beneficiaries and to assess beneficiaries' knowledge regarding the Medicare Part D program. Research will be conducted through the use of a survey given to individuals that have interacted with the Medicare Part D consult service at The UIC Outpatient Pharmacy, regardless of whether they signed up for a program. Subjects will be asked for basic demographic information as well as questions regarding their experience with the consult service.

Learning Objectives:

Determine the impact of a Medicare drug benefit consult service.

Assess beneficiaries' knowledge regarding the Medicare Part D program

Self Assessment Questions:

People eligible for Medicaid and Medicare will continue to receive prescription drug coverage from Medicaid. True / False

In order to receive prescription coverage from the Medicare Drug Benefit, patients must enroll in a prescription drug plan or Medicare Advantage drug plan. True / False

A RETROSPECTIVE REVIEW OF THE USE OF CAMPATH (ALEMTUZUMAB) FOR THE TREATMENT OF REJECTION IN KIDNEY TRANSPLANT PATIENTS

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Purpose: Acute cellular rejection (ACR) frequently occurs in the first weeks to months after solid organ transplantation and is the primary cause of chronic rejection and delayed allograft loss. The T lymphocyte is the main cell involved in this process. Campath-1H (alemtuzumab) is a monoclonal antibody effective against the CD52 molecule present on the surface of T and B cells. It effectively depletes immune cells by antibody-dependent cellular cytotoxicity, complement fixation, and induction of apoptosis of targeted cells, resulting in profound and sustained lymphopenia. Alemtuzumab use in acute renal rejection has shown promising results. In a study with 40 kidney transplant patients with biopsy proven rejections, treatment with alemtuzumab resulted in 95% patient survival and 73.5% graft survival. Following alemtuzumab administration, both T and B lymphocyte counts dropped profoundly and remained suppressed at one-third of baseline at one year. These data suggest that alemtuzumab may persist in vivo for months after administration and contribute to ongoing destruction of CD52+ cells; thereby, implicating its use in treating ACR. Thus, we will be retrospectively examining the use of alemtuzumab for ACR in our institution. Since the previous study also noted a significant incidence of serious infectious complications (35%) post alemtuzumab treatment, we will be evaluating the incidence of adverse effects and infectious complications post alemtuzumab administration as well.

Methods: This retrospective chart review conducted at the University of Illinois Medical Center at Chicago (UIMCC), will include all patients status post kidney transplant who had biopsy-proven or clinically suspected rejection and subsequently received treatment with alemtuzumab between February 2002 to August 2005.

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

Learning Objectives:

To evaluate the efficacy of alemtuzumab as a reversal agent of acute kidney rejection

To review the incidence of adverse effects and infectious complications associated with alemtuzumab administration

Self Assessment Questions:

Alemtuzumab administration is associated with a significant incidence of infectious complications. True or False

Alemtuzumab effectively reversed all acute kidney rejections. True or False

MEDICATION RECONCILIATION AND THE CONTINUUM OF CARE: FROM INPATIENT TO OUTPATIENT MANAGEMENT

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BACKGROUND: Medication reconciliation is essential to optimizing patient health outcomes and is identified by the Joint Commission on Accreditation of Healthcare Organizations as a national patient safety goal.

PURPOSE: The objective of this study is to determine if a patient's medication list at their first appointment at the Family Medicine Center following discharge from the hospital correctly reflected the patient's medication list at hospital discharge. The information obtained from this study will help determine if medication reconciliation following hospital discharge is being accurately performed or if current medication reconciliation practices need to be improved to ensure optimal continuity of patient care across the Community Health Network continuum.

METHODS: Using Community Health Network's electronic medical records to perform a retrospective chart review, the medication list at the first Family Medicine appointment following hospital discharge was compared to the list provided within the hospital discharge summary. The lists were compared to determine if any discrepancies exist and if those discrepancies were reconciled by the family medicine physician at that appointment.

RESULTS: There was an average of 3 medication discrepancies per patient when comparing the hospital discharge medications to those listed in the first clinic appointment following hospitalization. The average number of discrepancies per patient that could have resulted in harm was 2.1. The total number of discrepancies increased as time until follow up lengthened.

CONCLUSIONS: Current medication reconciliation processes need improvement. Efforts are currently underway to optimize these medication reconciliation processes and improve patient care along the health care continuum.

Learning Objectives:

Name the types of medication discrepancies found in this study.

Describe factors that may have contributed to these medication discrepancies.

Self Assessment Questions:

What types of medication discrepancies were discovered in this study?

What factors may contribute to medication discrepancies?

EVALUATION OF INTRAVENOUS PANTOPRAZOLE IN SURGERY AND TRAUMA PATIENTS

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Purpose: Stress related mucosal damage (SRMD) occurs due to an imbalance between injurious factors and protective mechanisms of the gastrointestinal tract secondary to mucosal ischemia. Multiple etiologies for SRMD exists including increased gastric acid and pepsin production, reduced mucosal blood flow, reduced intramucosal pH and impaired gastric defense mechanisms. Ultimately, splanchnic hypoperfusion results in SRMD which may lead to gastrointestinal bleeding (GIB). With the availability of intravenous pantoprazole, various dosing strategies have been utilized for SRMD prophylaxis with limited data. Additionally, mortality associated with upper gastrointestinal hemorrhage is approximately 7 – 10%. Thus, the primary objective of this retrospective study is to evaluate the indication and dosing strategies of intravenous pantoprazole for SRMD prevention and GIB in the surgery, trauma population and assess outcomes.

Methods: This IRB-approved, retrospective study evaluated patients admitted to Detroit Receiving Hospital from January 2004 to December 2005. Inclusion criteria consists of patients >=18 years of age, admitted to a general surgery, trauma service, and received intravenous pantoprazole for SRMD prevention or GIB treatment. Baseline data include patient demographics, age, hospital LOS and ICU LOS, and risk factors for SRMD. Evaluation of primary drug therapy will be performed regarding indication for pantoprazole and dosing strategies utilized. Secondary outcomes include endoscopic findings, rates of clinically evident or significant bleeding, utilization of concomitant blood products, change in hematological parameters, and mortality.

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

Learning Objectives:

To discuss the pathophysiology of stress-related mucosal damage.

To define appropriate proton pump inhibitor therapy for bleeding ulcers.

Self Assessment Questions:

Stress-related mucosal damage has been associated with splanchnic hypoperfusion. (T/F)

Patients at risk for stress-related mucosal damage include:
a.Mechanical ventilation > 48hours
b.Coagulopathy
c.Adminstration of high dose steroids
d.Thermal injuries > 35% body surface area
e.All of the above

EVALUATION OF CLINICAL AND MICROBIOLOGICAL OUTCOMES IN PATIENTS WITH METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS BACTEREMIA TREATED WITH VANCOMYCIN AND/OR DAPTOMYCIN

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Background: The incidence of nosocomial infections caused by methicillin-resistant Staphylococcus aureus (MRSA) has been steadily increasing. The most recent data from the National Nosocomial Infections Surveillance System depicts an 11% increase in MRSA rates in intensive care units (ICUs) in 2003 compared with the previous 5 years. Vancomycin has been traditionally the drug of choice for treatment of MRSA bacteremia. However, its slow killing activity and emergence of resistance has resulted in treatment failure, resulting in increased morbidity, mortality, and cost of hospitalization. Daptomycin is a novel cyclic lipopeptide antibiotic that also has activity against MRSA, but is only indicated for the treatment of skin and soft tissue infections. It is increasingly being used for the treatment of MRSA bacteremia as an off-label indication. Daptomycin has rapid bactericidal activity compared to vancomycin, which may shorten the duration of bacteremia.

Objective: To compare the clinical and microbiological outcomes of patients treated with vancomycin and/or daptomycin for MRSA bacteremia.

Methods: This study was a retrospective chart review of patients admitted with primary MRSA bacteremia from November 2003 to December 2005. A report was generated to identify patients with positive blood cultures for MRSA via a microbiology database system. A second report was generated from the pharmacy database to identify patients who received daptomycin or vancomycin therapy. Patients with blood cultures positive for MRSA, signs and symptoms of infection, and age >=18 were included in the study. Patients that received daptomycin or vancomycin followed by daptomycin were compared to patients that received vancomycin alone for the treatment of MRSA bacteremia. Patients were matched between the groups based on age, level of care (ICU/non-ICU), and APACHE II score (for ICU patients only).

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

Learning Objectives:

Discuss the rationale for use of daptomycin versus vancomycin for the treatment of MRSA bacteremia.

Discuss the clinical and microbiological outcomes associated with daptomycin and vancomycin for treatment of MRSA bacteremia.

Self Assessment Questions:

How many isolates of vancomycin-resistant Staphylococcus aureus have been reported in United States?

Does daptomycin have an FDA approved indication for the treatment of MRSA bacteremia? Y/N

DETERMINANTS OF COMPLIANCE AND PERSISTENCY WITH ADALIMUMAB (HUMIRA) MEASURED BY PHARMACY CLAIMS DATA IN A MANAGED CARE POPULATION

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Purpose: Limited data exists regarding the compliance and persistency of biologic response modifers in treating rheumatologic conditions. Studies suggest poor medication compliance leads to disease progression and affects the quality of life in patients with chronic conditions. Rheumatologic conditions for which adalimumab is FDA approved include rheumatoid arthritis (RA) and psoriatic arthritis (PsA). Nearly 50% of patients with RA will reach moderate disability within two years from disease onset. Patients with PsA present with symptoms ten years after the first signs of psoriasis. Advancing age represents a predisposing factor for both RA and PsA typically seen between ages 30 and 60. Psoriatic arthritis affects males and females equally, unlike RA where women are at three times greater risk. While there are certain variables that may affect medication-taking behavior in chronic conditions, standards to measure compliance and persistency have yet to be determined. This study identifies the impact of age, gender, and method of refill on the compliance and persistency of adalimumab prescribed patients using pharmacy claims data.

Study Design: Retrospective database analysis of pharmacy claims provided by a pharmacy benefits manager. Individuals who filled at least 12 consecutive weeks of adalimumab between October 2004 to December 2005 were followed over a 12-month period to determine measures of medication compliance and persistency.

Methods: Compliance was measured by the medication possession ratio (MPR) and persistence was determined according to the time of discontinuation. Patients whose MPR probability was higher than 0.8 were deemed compliant. Persistent patients were identified as those who filled prescriptions within the allotted grace period determined by the number of days supply received from their previous prescription fill.

Results: Work In Progress – Results Pending

Conclusion: Work In Progress – To be determined

References:
1. J Man Care 2005;11:449-57.
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Learning Objectives:

Understand the effect of age, gender, and method of refill on compliance and persistency.

Determine the persistency of adalimumab patients over the course of 12 months.

Self Assessment Questions:

Which factor had the greatest impact on the compliance and persistency of adalimumab patients?

At which time did the majority of adalimumab patients become non-compliant?

ADHERENCE TO THE 2004 AMERICAN COLLEGE OF CHEST PHYSICIANS CONSENSUS GUIDELINES FOR THROMBOPROPHYLAXIS IN ORTHOPEDIC SURGERY PATIENTS

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Purpose:
The American College of Chest Physicians outlines optimal therapy for venous thromboembolism (VTE) prophylaxis in their Seventh Consensus Conference on Antithrombotic Therapy. Venous thromboembolism is known to be a major cause of morbidity and mortality. Despite a large body of evidence of its effectiveness, and current practice guidelines, appropriate therapy for the prevention of VTE is often underused. The purpose of the study is to assess current practice patterns in the prevention of VTE in orthopedic surgery patients at a community teaching hospital and to determine the degree of adherence to established guidelines.

Methods:
The study is designed to be a descriptive, convenience sample, retrospective review. The study population includes all patients 18 years of age or older who were admitted for the purpose of a total knee arthoplasty, hip fracture surgery, or total hip arthroplasty from October 1, 2005 to December 1, 2005. All patients meeting these criteria during the two-month period were included in the study (n = 146). Patients were identified using ICD9 codes corresponding to the listed surgeries. Adherence to the guidelines was assessed as a nominal outcome of adherent versus non-adherent. Secondary variables include: type of prophylaxis; length of prophylaxis; total number of therapies received; number of risk factors; and prescribing physician category (e.g., resident, attending physician, orthopedic surgeon).

Results:
A total number of 146 patients were reviewed including: 30 hip fracture patients; 91 total knee replacement patients; and 25 total hip replacement patients. Complete results will be presented pending final completion of data collection and analysis.

Learning Objectives:

Recognize the risk factors for venous thromboembolism.

Determine the appropriate duration of thromboprophylaxis recommended for patients undergoing a total knee replacement, hip fracture surgery, or total hip replacement.

Self Assessment Questions:

Which of the following is NOT an absolute highest risk for thromboembolism?
A. Spinal cord injury
B. Total knee replacement
C. Increasing age
D. Hip fracture surgery

True or False: Established guidelines recommend a patient undergoing a total hip replacement should receive 28-35 days of VTE prophylaxis.

EVALUATION OF THE USE OF EZETIMIBE IN A VA MEDICAL CENTER

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Objectives:
The primary objective is to assess the efficacy of ezetimibe in patients with dyslipidemia according to the ATP III guidelines both as monotherapy and in combination with other lipid lowering agents. The secondary objectives are to evaluate the safety of ezetimibe therapy, to evaluate adherence to the VA criteria for use, and to determine if the use of concurrent and past anti-lipemics is appropriate.

Methodology:
Prior to commencement, this study will be submitted to the Institutional Review Board for approval. This study is a retrospective chart review evaluating the use of ezetimibe at the North Chicago VA Medical Center. The health system's electronic medical record system will be used to identify patients who have documented hyperlipidemia and an active prescription for ezetimibe at the time of the protocols approval. Using the computerized patient record system, the following information will be obtained: gender, age, and race, current dose and duration of therapy of ezetimibe, the use of previous and concurrent lipid lowering agents (statins, bile acid sequestrants, niacin, etc.), including dose, duration of therapy, and reason for discontinuation. Other data obtained will include date and results of last fasting lipid panel, date and results of baseline fasting lipid panel before ezetimibe was initiated, past medical history of diabetes or other CHD equivalents or risk factors, and date and results of last liver function and creatine phosphokinase (CPK) tests. Study information will be stored in a locked cabinet and made available only to the principle and co-investigator. Patient identifiable information including name and SSN will not be linked to the data collection sheets.

Results and Conclusion:
Data and results to be presented at the conference.

Learning Objectives:

To evaluate the efficacy and safety of ezetimibe as both monotherapy and combination therapy based on the adherence to the VA criteria for use.

Understand each individual patients LDL goal based on ATP III guidelines and the importance of patients reaching that goal.

Self Assessment Questions:

Identify the risk equivalents for coronary artery disease according to the new ATP III guidelines.

True or False: The use of ezetimibe in combination with a statin can decrease the ADRs seen with using high dose statins (example elevated liver function tests).

A RETROSPECTIVE REVIEW OF THE EFFECT OF LOW-DOSE ALDOSTERONE ANTAGONISTS ON LOOP DIURETIC DOSING IN THE TREATMENT OF HEART FAILURE

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Purpose: Through random observation during clinical practice in the Heart Failure (HF) Clinic at the University of Illinois Medical Center at Chicago (UIMCC), the addition of an aldosterone antagonist to HF treatment regimens appears to lead to a change in dosing of loop diuretics. The Randomized Aldactone Evaluation Study and the Eplerenone Post-Acute Myocardial Infarction Heart Failure Efficacy and Survival Study did not report if diuretic dosing changes had to be made during the study period. If aldosterone antagonists (in combination with an ACEI) have a natriuretic effect at low doses, there is the potential for an unexpected or excessive diuresis. If diuretic doses are not adjusted, overdiuresis may lead to hospitalizations caused by hypovolemia and/or acute renal failure.

Methods: This study will be a retrospective review of UIMCC HF Clinic patient charts. We will look at patients with a diagnosis of heart failure, who are on a loop diuretic at the time the aldosterone antagonist was started. Baseline data collected will include patient demographics, baseline medications, renal status, co-morbidities such as diabetes mellitus, acute myocardial infarction and hypertension. Loop diuretic dose changes, renal function and number of hospital admissions for hypovolemia/acute renal failure over a 12-month period after aldosterone antagonist initiation will be evaluated. Time from addition of the aldosterone antagonist to loop diuretic dose change will be calculated.

Results: About 100 charts will be reviewed. Results and conclusions from the evaluation of the effects of aldosterone antagonists on loop diuretics in HF patients will be presented at Great Lakes Residency Conference and overall results will be published.

Learning Objectives:

To evaluate the effects of aldosterone antagonists (spironolactone or eplerenone) on loop diuretic dosing in the treatment of Heart Failure and describe patient characteristics at the time of dosing changes

To examine the number of hospitalizations for hypovolemia and/or acute renal failure during the period of concomitant aldosterone antagonist and loop diuretic use

Self Assessment Questions:

True/False Aldosterone antagonists act as potassium-sparing diuretics at high doses, and only as aldosterone antagonists at low doses

True/False RALES and EPHESUS did not report loop diuretic dosing changes when the aldosterone antagonist was added to HF treatments at initiation of the studies

VANCOMYCIN AND METRONIDAZOLE IN THE TREATMENT OF CDAD: A RETROSPECTIVE ANALYSIS

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In the recent years, a new and more difficult strain of Clostridium difficile associated diarrhea has been defined in the literature. This has left practitioners questioning optimal therapy in the treatment of CDAD. The purpose of this study is to determine the efficacy of metronidazole and vancomycin in the treatment of Clostridium difficile associated diarrhea in our patient population. Secondary outcomes include evaluating relapse rates of both metronidazole and vancomycin.

Methods
A retrospective analysis was performed to determine the response from both metronidazole and vancomycin. Patients with a positive Clostridium difficile toxin assay were included. Patients receiving either agent for a period of 7 days or more were included and any therapeutic dosing regimen was accepted. Treatment was considered a success if there was a 75% reduction in the number of stools per day within five days of initiation of treatment. A follow up survey was administered by mail to determine whether or not patients have experienced a relapse or a reoccurrence.

Results
Full results of this study have not been compiled yet and will be presented at the meeting

Conclusion: Pending.

Learning Objectives:

List the various risk factors, other than antibiotic use, for developing Clostridium difficile associated diarrhea

Discriminate between metronidazole's and vancomycin's current place in therapy

Self Assessment Questions:

In the literature, what percentage of patients is estimated to relapse to treatment regardless of what agent is used?
A) <1%
B) 1-5%
C) 5-35%
D) >40%

What class of antibiotics has recently been associated with a higher rate of causing CDAD?
A)Lincomycins
B)Macrolides
C)Respiratory Fluroquinolones
D)Aminoglycosides
E)Tetracyclines

IMPACT OF A MIGRAINE PRIOR AUTHORIZATION PROGRAM ON UTILIZATION AND COST

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Introduction: Migraine headache is a common disorder that affects an estimated 18% of women and 6.5% of men in the United States. According to the National Headache Foundation, patients that require the use of acute medications more than 2 days per week may benefit from prophylaxis with a pharmacologic agent to reduce the frequency, duration, and severity of migraine attacks. A pharmacy benefits manager (PBM) has implemented a clinical prior authorization program to ensure appropriate maintenance therapy for migraines in patients prescribed acute migraine medications.

Objective: The primary purpose of this study is to determine the impact of a clinical prior authorization program on utilization and cost of migraine medications.

Methods: Prescription records from January 1, 2004 to December 31, 2005 will be reviewed from an administrative pharmacy claims database. A retrospective cohort study design with a twelve-month pre-implementation and twelve-month post-implementation period will be used. This study will include the number of patients receiving prophylactic and/or acute migraine medications. The number of prescriptions and quantity dispensed per thousand eligible members and per member per month (PMPM) total, plan and member costs will be assessed and compared between the groups and between the pre- and post-implementation periods.

Results/Conclusions:
Pending completion of data collection.

Learning Objectives:

Discuss medication therapy used in the treatment and prevention of migraine headache.

Determine the impact of a clinical prior authorization program on utilization and cost.

Self Assessment Questions:

What are the goals of treating acute migraine attacks?

True or False: A migraine clinical prior authorization program can decrease the number of prescriptions and the quantity dispensed of abortive migraine medications.

USE OF INTRAVENOUS POLYMYXIN B FOR THE TREATMENT OF MULTI-DRUG RESISTANT GRAM-NEGATIVE BACTERIAL INFECTIONS

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Background: With the increasing use of broad spectrum antibiotics, the rate of multi-drug resistant gram negative organisms is on the rise. The polymyxin antimicrobials are often a last line of effective therapy for these organisms, however their clinical use is limited due to their propensity to cause nephrotoxicity and neurotoxicity. Recent reports describe the utility of colistimethate in the treatment of multi-drug resistant gram negative infections with lower reports of toxicity than in past literature. Recent data regarding the clinical use and associated toxicity of polymyxin B is limited.

Purpose: The purpose of this study is to describe our clinical experience with the use of intravenous polymyxin B for the treatment of multi-drug resistant gram-negative infections.

Methods: The study design is a retrospective descriptive chart review of all patients who were administered intravenous polymyxin B for the treatment of gram-negative infections at The MetroHealth Medical Center in Cleveland, Ohio, within the dates of June 1, 2002 through June 1, 2005. The patient charts reviewed included all patients with a pharmacy dispensing record of intravenous polymyxin B within the predetermined time frame.

Information analyzed included patient demographics, co-morbidities, infection site, microbial susceptibility data, renal function status throughout the treatment, adverse drug reactions, and the clinical outcome of the treatment.

Results/Conclusions: The data has been collected and is in the process of being analyzed. Results will be presented during the residency conference.

Learning Objectives:

Discuss the role of polymyxin B in the treatment of gram-negative infections.

State the adverse reactions associated with intravenous polymyxin B.

Self Assessment Questions:

The risk of nephrotoxicity with intravenous polymyxin B is not correlated with its dose. T / F

Polymyxin antibiotics do not have coverage against gram negative anaerobes. T / F

EVALUATION OF GLUCOSE CONTROL IN NON-ICU PATIENTS RECEIVING PARENTERAL NUTRITION

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Purpose: The objectives of this study are to determine the frequency of blood glucose abnormalities in non-ICU patients receiving parenteral nutrition (PN), and to identify the most common causes and most effective treatments for these blood glucose abnormalities.

Methods: Data was retrospectively collected in 50 non-ICU patients who received PN during July and August, 2005. Data collected include patient demographics, conditions predisposing to hyper- or hypoglycemia, blood glucose (BG) values, serum creatinine and liver function tests. Factors contributing to a BG outside of the defined goal range of 80-200 mg/dL and corrective actions taken were recorded for each occurrence.

Results: Hyperglycemia occurred in 44% of patients (22 of 50). The average BG in patients with at least one BG > 200 mg/dL (n=22) was significantly higher than that of patients with all BG within the goal range (n=22; 155 vs. 126 mg/dL respectively, $p<0.0001$). Presence of hyperglycemia was significantly associated with the presence of at least one identified risk factor (Fisher's Exact Test $p=0.0087$). The most common causes of hyperglycemia are excess dextrose and inadequate insulin. Insulin in PN is the most successful method of correcting hyperglycemia. (Insulin drips were not used outside of ICUs at our institution at the time of this study). Hypoglycemia is less frequently observed (25%). The most frequently identified cause of hypoglycemia is cycled PN.

Conclusion: Our approach to PN dosing (26-28 kcal/kg/day in a 3-in-1 formulation with 30% of calories as IV fat emulsion, resulting in glucose infusion rates of 2.5-3 mg/kg/min) is designed to minimize hyperglycemia. Institutions using 2-in-1 formulations and/or larger dextrose doses may observe a higher incidence of hyperglycemia. Additional studies are needed to determine optimal blood glucose goals and the effect of tighter glycemic control on clinical outcomes in this patient population.

Learning Objectives:

Describe the frequency of blood glucose abnormalities in non-ICU patients receiving parenteral nutrition.

Identify the most common causes and most effective treatments for these blood glucose abnormalities.

Self Assessment Questions:

What is the most common cause of hyperglycemia in non-ICU patients receiving parenteral nutrition?

What is the most effective method of treating hyperglycemia in non-ICU patients receiving parenteral nutrition?

THE EFFECTS OF A PHARMACIST RUN HIV ADHERENCE PROGRAM ON HIV VIROLOGIC OUTCOMES

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Statement of purpose:
The purpose of this study is to show the effect on virologic outcomes of patients who participate in the pharmacist-run adherence program.

Statement of methods:
The human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) represents a significant health-care problem. With the advent of highly active antiretroviral treatment (HAART) HIV/AIDS has become a chronic disease. Although HAART has been successful, there are limits to efficacy, one being poor adherence.

The adherence program is offered to all new HAART starts at University Health Center in Detroit, MI. The program consists of three educational sessions with a pharmacist. Follow up calls are made after each visit to reinforce education, and assess any problems with therapy.

Design: A retrospective controlled study of 50 patients from the program and 50 patients initiated on HAART therapy in the year prior. Demographic data from 25 concurrent patients not referred to the adherence program will be collected. Inclusion criteria are treatment naïve new HAART starts.
Outcomes: The primary endpoint is the percentage of patients who achieve undetectable viral load (VL) at 24 weeks of HAART. Secondary endpoints will include VL at weeks 4, 12, and change in CD4 count at 24 weeks. Adherence and demographic data will be identified using chart review.
Analysis: Based on estimations that 65% and 85% will reach undetectable VL after 24 weeks in the control group and the adherence group respectively, 100 patients are needed to show significance. Continuous data will be assessed using the student's t-test and nominal data will be compared using the Chi square test.

Learning Objectives:

Define key barriers to adherence in HIV patients.

Describe patient specific intervention techniques to improve adherence.

Self Assessment Questions:

The largest predictors of non-adherence in HIV patients include:
a. Depression
b. Insurance coverage
c. Substance abuse
d. Both a and c
e. Both a and b

True or False. Pillboxes are not useful tools in HIV adherence.

DARBEPOETIN ALFA AND EPOETIN ALFA UTILIZATION IN A VA POPULATION: A RETROSPECTIVE ANALYSIS OF WILLIAM S. MIDDLETON MEMORIAL VETERANS HOSPITAL

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Objective:
The purpose of this retrospective analysis is to collect data for a drug utilization evaluation on darbepoetin alfa and epoetin alfa to determine the overall usage and monitoring patterns of these medications in VA patients.

Methods:
The study is a retrospective chart review of patients with an active prescription for darbepoetin alfa or epoetin alfa on the randomly selected day November 26, 2005. All patients with an active darbepoetin alfa or epoetin alfa prescription from that day will be included in data collection. Data collection includes: age, weight, sex, race, epoetin alfa or darbepoetin alfa indication, presence of contraindications, date treatment was initiated, therapy duration and if therapy is ongoing, service initiating therapy, if previous therapy had been tried with the date, drug, last dose, and reason for switching, current dosing regimen, dosing route and administration, iron supplementation presence, and iron supplementation dosing. Information regarding baseline and current characteristics including dates and values of hemoglobin, hematocrit, serum ferritin, transferrin saturation, total iron binding capacity, erythropoietin level, blood pressure, serum creatinine, number of transfusions, when last hemoglobin or hematocrit monitoring had occurred, if last hemoglobin was in a range of 11g/dl to 12g/dl, if last hematocrit was in a range of 33% to 36%, and adverse reactions. The data will be collected using the Computerized Patient Record System (CPRS) and the pharmacy prescription profile. This is a retrospective chart review and no interventions will result from this study.

Results:
Data will be collected and results will be presented.

Conclusions:
Conclusions will be drawn regarding the usage and monitoring patterns of darbepoetin alfa and epoetin alfa. A better understanding and knowledge base regarding these medications use in VA patients will be obtained. This may lead to more appropriate monitoring and improve prescribing guidelines leading to more cost-effective use of these medications.

Learning Objectives:

To identify overall usage patterns of darbepoetin alfa and epoetin alfa in a VA population.

To identify monitoring patterns of darbepoetin alfa and epoetin alfa as well as occurrence of concurrent iron supplementation in a VA population.

Self Assessment Questions:

True or False: Being iron deplete can influence the effectiveness of darbepoetin alfa or epoetin alfa therapy.

True or False: Darbepoetin alfa is an inexpensive medication and does not require monitoring.

ANALYSIS OF PRESCRIBING AND UTILIZATION PATTERNS OF BIOLOGIC RESPONSE MODIFIERS (BRMS) AND DISEASE-MODIFYING ANTI-RHEUMATIC DRUGS (DMARDS) USED TO TREAT RHEUMATOID ARTHRITIS

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According to The Centers for Disease Control statistics, Reumatoid Arthritis (RA) affects approximately 1 percent of the U.S. population. The development of BRM therapies such as etanercept, infliximab, adalimumab, and anakinra has made remarkable advances in RA treatment.(1) Although clinically promising, BRMs are significantly more expensive than traditional DMARDs. The annual cost of BRM therapy per patient can range from $15,000-$30,000 US dollars, whereas the cost of treatment with traditional DMARDs ranges from $200-$600 US dollars per year.(2) Because of the extreme variance in dollar amount for the rheumatoid arthritis therapies, healthcare payors strive to maximize outcomes with the most cost-effective options. Pharmacy benefit managers and specialty pharmacies have developed clinical management programs as one way of achieving this goal. A retrospective database analysis of prescription claims from January 2004 to December 2005 will be conducted to determine the prescribing and utilization pattern of DMARDs and BRMs used for the treatment of RA. Utilization patterns such as history of DMARD use prior to initiation of BRM therapy, duration of use, dosing of BRMs, dose escalations, and discontinuation/switch rates will be determined. Physicians will be distinguished by area of practice specialty (i.e. rheumatology) and their prescribing patterns of DMARDs and BRMs will be analyzed. All prescribing and utilization information will be used to identify opportunities and assess the impact of clinical management programs.

Learning Objectives:

To evaluate the prescribing and utilization patterns of DMARDs and BRMs used in the treatment of rheumatoid arthritis.

To identify opportunities and assess the impact of clinical management programs used for rheumatoid arthritis patients.

Self Assessment Questions:

Can I describe trends in utilization of biologicals used for the treatment of rheumatoid arthritis?

In a pharmacy benefit management setting, how and where can clinical management programs have impact on the prescribing patterns and utilization of biologicals used to treat RA?

DESIGNING PHARMACY SERVICES BASED ON PATIENT PREFERENCES: A PROACTIVE APPROACH

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Purpose:
Previous research has shown that if patients do not perceive that interacting with their pharmacist is beneficial to their health, they are unlikely to participate in newly created pharmacy-based services. Additional research has also reported that consumer perceptions of pharmaceutical services need to be measured in order to maximize marketing strategies and satisfy customer wants and needs. The purpose of this study is to identify pharmacy-based services, especially those beyond traditional dispensing activities that are desired among varying patient populations for use in evaluation and quality improvement of current pharmaceutical services.

Methods:
An anonymous, self-administered survey was developed to assess demographics of study participants and desired services in community pharmacies. The surveys were handed out by study investigators to grocery store patrons at eight different locations within central Ohio over a 1 month period. Each survey event was approximately four hours in length.

Results:
163 surveys were completed at the end of the data collection period. Data are being analyzed to determine what pharmacy-based services are desired in community pharmacies based on study participant demographics. Study investigators will also utilize the information to provide input for future marketing and for strategic planning associated with expansion and modification of current services in community pharmacies.

Conclusion:
This study intends to provide innovative pharmacy practitioners with a range of patient preferred services that could be incorporated into community pharmacies. Implications for this include expanding current pharmacy-based services, initiating new services, and educating patients about the expanded role of pharmacists and their ability to offer more than just traditional dispensing services. The profession must be mindful in assuring that pharmacy services offered complement patient interest. Acknowledging this concept prior to instituting new or updated services will potentially lead to increased value and enhanced utilization rates.

Learning Objectives:

To identify expanded pharmacy services which are available for implementation in community pharmacies.

To identify patient characteristics that may predict the success of individual pharmacy services in community pharmacies.

Self Assessment Questions:

True or False: If patients do not perceive that interacting with their pharmacist is beneficial to their health, they are likely to take advantage of newly-created pharmacy-based services.

True or False: Consumer perceptions of pharmaceutical care need to be measured in order to identify customer wants and needs in addition to maximizing marketing strategies.

BETA-BLOCKADE THERAPY IN HEART FAILURE: PHYSICIAN ADHERENCE TO GUIDELINES AND READMISSION RATES

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Background:
The American College of Cardiology/American Heart Association Guidelines for the Evaluation and Management of Chronic Heart Failure in the Adult gives a Class I recommendation for the use of beta-blockade in patients with a reduced ejection fraction. Due to the overwhelming evidence in favor of reduced morbidity and mortality,beta-blockers should be prescribed to all patients with stable heart failure due to left ventricular systolic dysfunction unless they have a contraindication to their use or have been shown to be intolerant. Previous data has indicated that patients are frequently not started on beta-blockade therapy during hospitalization and are also not started on beta-blockade therapy prior to discharge.

Purpose:
The purpose of this study was to assess beta-blockade initiation in hospitalized patients with a diagnosis of heart failure as well as to assess readmission rates.

Methods:
A retrospective chart review was conducted to identify patients with a diagnosis of heart failure through ICD-9 coding. Patients were included if they were staff medicine patients at least 18 years of age with a diagnosis of heart failure and a recent 2D echocardiogram. Exclusion criteria included: patients previously initiated on a beta-blocker, those with an ejection fraction > 45%, patients admitted to the intensive care unit, evidence of moderate-to-severe fluid overload, treatment with an intravenous positive inotropic agent, moderate to severe persistent asthma or COPD, symptomatic bradycardia, 2nd or 3rd degree AV block, NYHA Class IV Heart Failure, diastolic heart failure in the absence of systolic dysfunction, and/or previous documented intolerance or allergy to beta-blockade therapy. Appropriate initiation of a beta-blocker in accordance with guidelines was reviewed for each patient. One-year readmission rates for patients initiated on beta-blockade therapy were compared to those not initiated on therapy.

Results/Conclusions:
The results and conclusions of this study will be presented at the Great Lakes Pharmacy Conference, April 2006.

Learning Objectives:

List the major contraindications to using beta-blockade therapy in heart failure patients.

Discuss evidence-based recommendations for using specific agents within the beta-blocker class of medications.

Self Assessment Questions:

True or False: A beta-blocker is always indicated when a patient is receiving dobutamine.

Which three beta-blockers have been shown in clinical trials to reduce morbidity and mortality from heart failure?

IDENTIFICATION AND AVOIDANCE OF MEDICAL ERRORS DURING PHARMACIST DIRECTED MEDICATION RECONCILIATION.

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Obtaining patient medication histories upon admission is a hospital initiative emphasized by many health standard promotional groups to prevent complications and extended hospital stays due to medication errors. In January 2006, Clarian Health Partners implemented a pharmacist directed medication reconciliation program. Within 24 hours of a patient admission, a medication history is obtained by a trained pharmacist, pharmacy technician, nurse, or physician. Inconsistencies in the medication history and the prescribing process that are identified upon medication reconciliation can be documented through a voluntary electronic reporting system. Pharmacists play an important role in not only documenting the discrepancies found, but also making clinical interventions to prevent medication errors as a result of medication reconciliation. The goals of this project are to categorize the types of variances found and analyze the clinical interventions made through the medication reconciliation process.

This retrospective analysis will assess medication variances reported during the first four months of the medication reconciliation program at Methodist Hospital of Clarian Health Partners. Medication variances will be categorized into four main areas 1) sub-optimal or inappropriate therapies due to current medical condition/disease state, 2) discrepancies from the medication profile, 3) errors in recorded allergies, and 4) non-compliance or discontinuation of medications by patient. Severity levels of medication variances prevented will also be recorded. Preliminary results will be presented.

Learning Objectives:

List 2 types of variances that are may be found upon a pharmacy obtained medication history.

Understand the importance of obtaining a patient's most accurate and up-to-date medication history.

Self Assessment Questions:

T F Medical errors that occur within a patient's hospital stay may be due to an inaccurate medication history that was obtained upon admission.

T F Medication reconciliation is a JCAHO 2006 National Patient Safety Goal.

EVALUATION OF AMINOGLYCOSIDE AND VANCOMYCIN THERAPEUTIC DRUG MONITORING

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Objective: To assess whether Rush University Medical Center guidelines for the use of aminoglycoside and vancomycin serum levels are followed. Appropriateness and safety of initial antibiotic regimens will also be assessed. Methods: This study was approved by the Rush Institutional Review Board. Subjects for the retrospective chart review were identified from laboratory reports of patients who had antibiotic serum levels drawn in the preceding week. Pregnant patients and patients less than 18 years old were excluded. Data collected included: patient identifiers, age, gender, pathogen, site of infection, renal function, allergies, complete antibiotic regimen and antibiotic serum concentration draw times and values. The extent to which antibiotic doses and serum level measurements comply with the Rush Aminoglycoside/Vancomycin Nomogram was assessed. Specifically, the appropriateness of serum levels was determined based on dosing strategy, timing in relation to antibiotic administration, and usefulness in altering antibiotic regimens. Antibiotic regimens were assessed for appropriateness and safety based on infectious etiology, body weight, and renal function. Results: Fifty patients and 91 antibiotic serum levels were assessed within the ten day analysis period. 46.3% of vancomycin levels were inappropriate with respect to need and 17.9% were inappropriate with respect to timing. 19.4% of aminoglycoside levels were inappropriate with respect to need and 25.8% were inappropriate with respect to timing. The most common reason for an inappropriate vancomycin level was that it was drawn too early in random dosing. The most common reason for an inappropriate aminoglycoside level was that it was drawn outside of the 6-14 hour window based on the Hartford nomogram. Conclusion: A pharmacist-managed consult service would be most justified for those patients with a creatinine clearance of less than 20 ml/min and those on Continuous Renal Replacement Therapy. This data will be used in the development of a pharmacist-managed consult service.

Learning Objectives:

Identify patients that require antibiotic serum concentration monitoring.

Correlate specific antibiotic dosing strategies with appropriate timing of serum concentrations.

Self Assessment Questions:

Vancomycin trough concentrations should be measured:
a.In patients receiving random vancomycin dosing due to hemodialysis.
b.After the first dose of vancomycin in a patient with CrCl = 35 ml/min.
c.After three scheduled doses or with a change in renal function in a patient with endocarditis.
d.Never, trough concentrations do not correlate with efficacy.

A patient with neutropenic fever is empirically started on tobramycin 7 mg/kg IV q24h. A timed tobramycin level should be ordered:
a.A timed level should not be drawn with daily tobramycin administration.
b.After the third dose of tobramycin, once the patient has reached steady state.
c.Within 6-14 hours after the first dose of tobramycin.
d.Within 30 minutes of the next tobramycin dose.

IMPACT OF A PHARMACIST-MANAGED MEDICATION ASSISTANCE PROGRAM ON CLINICAL OUTCOMES

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More than 45 million Americans are without health insurance and cannot afford costly medications. Pharmaceutical companies have developed medication assistance programs (MAPs) in an effort to provide prescription medications at no cost or at reduced cost to indigent patients. Pharmacists play a vital role in the application process for obtaining medication assistance from pharmaceutical companies by serving as liaisons between the pharmaceutical company, the patient and the physician. It is well documented that MAPs reduce health care costs to the patient, however, there are limited data demonstrating that MAPs decrease adverse clinical outcomes. The purpose of this study was to determine if participation in a pharmacist-managed MAP reduces the number of acute care visits, emergency room visits and hospital admissions associated with lack of medications.

This was a retrospective chart review of patients enrolled in the pharmacist-managed MAP at the William Beaumont Hospital Outpatient Medical Resident Clinic. The number of acute care visits, emergency room visits and hospital admissions related to lack of medications prior to enrollment in the pharmacist-managed MAP was compared to the number after enrollment into the program. Men and women at least 18 years of age without prescription insurance who had received at least one medication through the pharmacist-managed MAP were included in the study.

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

Learning Objectives:

Identify reasons for the recent increased utilization of medication assistance programs.

Understand the purpose of medication assistance programs and the process used by pharmacists to obtain free or reduced cost medications through these programs.

Self Assessment Questions:

According to the United States Census Bureau, over 45 million Americans are without health insurance. True or False.

What is the primary role of the pharmacist in the process of obtaining free or reduced cost medications for indigent patients through medication assistance programs?

EVALUATION OF INAPPROPRIATE MEDICATION IN POLYPHARMACY

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The VA Ann Arbor Healthcare System (VHAAHS) provides care for a wide range of veterans, many of whom require multiple medications in order to manage chronic conditions. Polypharmacy has been defined in numerous ways, but for the purposes of this study will be defined as having prescriptions for 10 or more medications. The question arises as to whether all medications a veteran receives have been prescribed appropriately. The purpose of this study is to determine the prevalence of and potential risk factors for inappropriate drug prescribing in the veteran population exposed to polypharmacy who receive primary care through the VAAAHS.

This single center, cross sectional, retrospective study identifies patients at VAAAHS who are at risk for inappropriate medication prescribing. Patients will be randomly sampled from a database that contains all patients who have active prescriptions for 10 or more medications from the VAAAHS patient population. One of the many tools available for evaluating the appropriateness of medication prescribing is the Medication Appropriateness Index (MAI). The MAI will be applied to each medication on the patient's medication list on the day of enrollment to determine if the medication is inappropriately prescribed. Patient specific data necessary to complete the MAI will be obtained from the patient's chart. The number of inappropriate medications will be determined for each patient. This number will be used in a multivariate analysis of patient specific factors in order to identify potential risk factors for inappropriate medications. These potential risk factors include a diagnosis of depression, the number of chronic diseases, the number of prescribing providers, the total number of medications, number of emergency or urgent care visits, and number of inpatient admissions.

Results and conclusions pending.

Learning Objectives:

To determine the prevalence of inappropriate medication prescribing in patients exposed to polypharmacy at the VAAAHS

To identify potential risk factors for inappropriate medication prescribing in this population

Self Assessment Questions:

The number of medications that mark exposure to polypharmacy has been consistently defined in the literature. T/F

The Medication Appropriateness Index is the only available tool for evaluating prescribing of inappropriate medications. T/F

IMEPLEMENTATION AND EVALUATION OF A MEDICATION RECONCILIATION PROGRAM

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Objective: JCAHO has made reconciling medications across the continuum of care a 2005 National Patient Safety Goal. The objective of this study was to implement a pharmacist-directed medication reconciliation process and to evaluate if this process leads to a reduction in medication errors and admission order clarifications.

Methodology: A medication reconciliation service was implemented by the pharmacy department. This service consists of a pharmacist or pharmacy intern obtaining and assessing a medication history for hospital admissions from the emergency department during pre-selected hours at the point of admission. The medication and allergy histories are acquired by the pharmacist or intern through patient and family interviews, review of medication bottles, calls to pharmacies and physician's offices, as well as any other means necessary to achieve an accurate history. For each medication the drug name, dose, route, frequency, and time and date of last dose is recorded. The home medications are then reviewed for any potential problems such as contraindications, drug interactions, therapeutic duplications, and formulary substitutions. A form containing the medication history is placed in the patient's chart, which allows the admitting physician an opportunity to review the information and determine which medications should be continued. The physician can then use this form as an order by marking which medications are to be continued at admission. This form is left in the chart so it can be reviewed at discharge.

A retrospective chart review of patients admitted prior to and after the implementation of the medication reconciliation process will be performed. Collected data will be analyzed to determine if there is a difference in the number of potential medication errors and clarifications required.

Data collection is in process.

Learning Objectives:

To recognize the benefit of pharmacist-collected home medication histories and their potential impact on patient safety.

To develop an awareness of some of the potential barriers to medication reconciliation.

Self Assessment Questions:

Pharmacists are able to reduce the number of clarifications required for admission orders. T/F

The two most common clarifications required on admission orders written before implementation of a medication reconciliation process were for incomplete orders and incorrect doses. T/F

EVALUATION OF DROTRECOGIN ALFA (ACTIVATED) USE IN SEVERE SEPSIS: A RETROSPECTIVE REVIEW

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The mortality rate of those presenting with severe sepsis is between 30 to 50 percent and time to therapy is believed to have direct effect on patient outcome. This includes measures such as initial resuscitation, cultures, empiric and directed antibiotics, infection source control, restoration of organ perfusion, treatment of relative adrenal insufficiency, and use of drotrecogin alfa (activated) in an identified subpopulation of severe sepsis patients. Drotrecogin alfa (activated) is labeled for patients with a high mortality risk based upon the results of PROWESS. This study is performed to evaluate patients with severe sepsis receiving drotrecogin alfa (activated) and also severe sepsis and a high risk of death for this patient population.

The TSI database from June 30, 2004 to July 1, 2005 was utilized to compile the population evaluated. Subjects were included if they were greater than 17 years, prescribed drotrecogin alfa (activated), admitted to Methodist Hospital between June 30, 2004 and July 1, 2005, and chart available for review. Data obtained from the medical records included ICU admission date/time, surgical interventions, number of packed red blood cell transfusions, surgical or nonsurgical admission, APACHE II scores, SOFA scores, number of organ dysfunctions at time of drotregocin alfa (activated) initiation, mechanical ventilation use, vasopressor use, ICU or non-ICU status 24 hours prior to initiation of drotrecogin alfa (activated), infection source, cultures, volume to maintain CVP 8 to 12, empiric and directed antibiotics, corticosteroid use, serum glucose concentrations, and patient disposition following ICU stay will be collected. Parameters were monitored for days one to seven of subject hospital stay and at discharge. Results will be utilized in the determination of optimizing treatment of severe sepsis and opportunities to improve care of future patients.

Learning Objectives:

List a variable identified as a high risk for mortality in the study population.

Understand the importance early identification and treatment of severe sepsis.

Self Assessment Questions:

T F Empiric antibiotics should not be narrowed during the course of treatment of a severe sepsis patient.

T F The Surviving Sepsis Guidelines recommend the use of drotrecogin alfa (activated) in all septic patients.

EFFECTS OF LIPOPROTEIN APHERESIS ON AMBULATORY-MEASURED BLOOD PRESSURE

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The purpose is to evaluate the effect of lipoprotein apheresis on blood pressure in patients unresponsive to or unable to take conventional anti-hypercholesterolemia therapies. The primary objective is to determine if lipoprotein apheresis results in a significant reduction in mean arterial blood pressure. Analysis of blood pressure response will include the magnitude of changes in LDL, HDL and triglycerides to look for any association between lipoprotein fractions and blood pressure changes.

Patients undergoing lipoprotein apheresis at The National Institute for Fitness and Sport in Indianapolis, Indiana are eligible for participation. Patients who are unable to undergo blood pressure checks due to physiological or physical limitations of the upper extremities or who are scheduled to undergo direct electrical cardioversion will be excluded. Three sets of blood pressure measurements will be obtained for each enrolled patient: at day -1, at day +1, and day +7 of the two-week apheresis cycle. Patient demographic information and medical history including hyperlipidemia disorders, lipid levels, and blood pressure measurements will be collected. Antihypertensive and lipid-lowering medications will also be documented

A repeated measures analysis of variance including a random effect for day, as well as measurement within day, will be performed. Since there are multiple correlated measurements each day, the detectable change in blood pressure is expected to be less than 10 mmHg. Based on a paired t-test of the average daily measurement using historical data from 4 patients, there is 81% power at the 0.05 level of significance to detect a 10 point drop in systolic blood pressure if the standard deviation of the differences is 4.6.

After IUPUI IRB approval was granted, data collection began in January, 2006. Results will be presented at the Great Lakes Resident Conference in April 2006.

Learning Objectives:

Evaluate published literature on the vascular effects of lowering LDL cholesterol.

Identify major mechanisms of resistance to lipid-lowering with conventional pharmacologic therapy.

Self Assessment Questions:

Identify two proposed mechanisms for blood pressure reduction with lipid-lowering therapy.

Describe two genetic variations associated with elevated serum cholesterol levels.

BRIDGING THE GAP BETWEEN OUTPATIENT AND INPATIENT HEALTHCARE PROFESSIONALS BY UTILIZING AN ELECTRONIC MEDICATION RECORD (ELMER)

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Objective: Poor communication between health care professionals is known to be a source of medication errors and adverse drug events. The purpose of this study is to demonstrate that improved communication between outpatient and inpatient health care providers at time of hospital admission will decrease the number of medication discrepancies at discharge.

Methodology: Upon obtaining informed consent, one hundred patients from an internal medicine practice who are admitted to the hospital will be randomized to either the study or control arm. Medication lists for patients in the study arm will be stored electronically with access limited to the pharmacists at the medical office and the hospital. The Pharmacy Department at the hospital will reconcile the electronic medication record (ELMER) with the traditional medication list obtained at admission. Discrepancies (defined as medication started based on diagnosis in hospital, prescriber's decision not to continue treatment, formulary substitution, omission of medication or instructions, commission of medication, different dose route or frequency of medication, different medication order in hospital, and formulary substitution made but not reconciled at time of discharge) will be noted. Patients enrolled into the control arm of the trial will only receive usual and customary care. The primary outcome will be the number of discrepancies in the discharge medication list of the study arm compared to the control arm at time of discharge. The number of discrepancies between the ELMER and traditional medication list obtained at time of admission will also be analyzed as a secondary outcome. Upon completion of the study, the pharmacists at the medical office will follow up with the patients involved in the study as necessary for continued medical care. Patients will be asked at that time how they are taking their medication and allowed to ask any questions about the study. Results to follow.

Learning Objectives:

Identify characteristics that predispose a patient to medication errors

Identify points in the healthcare experience prone to medication errors

Self Assessment Questions:

What are three advantages of an electronic medication record?

T/F Nearly half of all medication errors occur at transition points.

ASSESSING THE INCIDENCE OF UNTREATED DEPRESSION IN THE ELDERLY OUTPATIENT WITH CO-MORBID MEDICAL CONDITIONS USING A MODIFIED VERSION OF THE GERIATRIC DEPRESSION SCALE (GDS 15)

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Objective: While the incidence of depression in elderly inpatients is estimated to be as high as 45%, less is known about the incidence of depression in elderly outpatients. Furthermore, detection of depression in elderly outpatients by medical staff is believed to be poor. The purpose of this observational study is to assess the incidence of untreated depression in a community based geriatric population. The secondary objective is to determine if a correlation between depression and pre-specified chronic illnesses exists.

Methodology: Patients from an internal medicine practice will be screened for depression using a modified version of the Geriatric Depression Scale 15 (GDS 15), a self-administered survey of 15 questions. Patients will also indicate whether they have chronic conditions including diabetes, heart failure, heart disease, past stroke, TIA, cancer or kidney failure. Data collected will be used to determine the incidence of depression in this ambulatory geriatric population and also analyzed for a correlation with the above mentioned disease states. A Pfizer Clinical Education Consultant will
assist with data analysis of the blinded, de-identified data. Results to follow.

Learning Objectives:

Present a modified version of the Geriatric Depression Scale 15 (GDS 15) as a possible tool to aid in the diagnosis of depression

Identify preexisting conditions that may predispose a patient to depression

Self Assessment Questions:

What is the incidence of depression in this geriatric patient population with chronic conditions?

Which chronic condition has the highest correlation with depression in this geriatric population?

REVIEW AND DEVELOPMENT OF OUTPATIENT ONCOLOGY CLINICAL PHARMACY SERVICES

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Oncology services are largely provided in ambulatory clinics rather than inpatient. Many of the clinical pharmacy services have traditionally been designed around inpatient care. Therefore, there exists a need to develop ambulatory models of pharmacist involvement in oncology care. Scant literature, mostly in form of abstracts from national meetings, is available regarding current oncology clinical pharmacy services and the outcome of their interventions.
In order to implement outpatient oncology clinical pharmacy services at the University of Michigan Comprehensive Cancer Center, this project aims at reviewing the current literature regarding outpatient oncology clinical pharmacy services and survey major cancer centers regarding their provision of oncology clinical pharmacy services. To achieve our aims, a survey form is developed and addressed to major cancer center in an attempt to collect data on their clinical pharmacy services. Once the project is completed, the review will be useful to many institutions beginning to establish outpatient oncology clinical pharmacy services.
The project involves a survey form that will be used to collect data from cancer centers. A panel of questions divided in three major categories related to clinical pharmacy services provided in outpatient cancer centers is developed. The categories are A) demographics and background information on the cancer center, B) the role of the oncology clinical pharmacist, C) the outcomes that have been assessed since the implementation of the clinical pharmacist position. The survey form is sent through list serves and also targets the department of pharmacies at the NCCN Cancer Centers. Phone surveys will be scheduled subsequently as a follow-up to the survey form to maximize data collection. The results will be analyzed and presented at the Great Lake Conference.

Learning Objectives:

Discuss the current literature available on outpatient oncology clinical pharmacy services

Review results of surveys collecting data on outpatient oncology clinical pharmacy services

Self Assessment Questions:

List two patient care functions that were commonly provided by the outpatient oncology clinical pharmacists

Cite two benefits of implementing outpatient oncology clinical pharmacy services

IMPACT OF THE VENOUS ARTERIAL BLOOD MANAGEMENT PROTECTION (VAMP) SYSTEM ON CENTRAL LINE INFECTION RATES IN CHILDREN AFTER CARDIAC SURGERY

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Over 90% of bloodstream infections in children are associated with intravascular catheter devices. Catheters increase the risk of bloodstream infections, endocarditis, and septic thrombophlebitis. These infections can lead to increased mortality, morbidity, hospital stay, and hospital costs. The average rate of catheter-related blood stream infection (CRBSI) per 1000 line days is 6.6 in pediatric intensive care units nationally. Children undergoing cardiovascular (CV) surgery are often candidates for a central venous catheter (CVC) as well as arterial lines and may have their lines accessed frequently. Blood conservation systems, such as the VAMP system, were designed to reduce needle-sticks, blood loss during sampling, transfusion requirements, and infection. Clarian implemented the VAMP system at Riley Hospital for Children in November 2004 following a bacteremia outbreak in the CV surgery population. During this outbreak, the CRBSI rate was 22.2/1000 line days. Subsequent data from Clarian Infection Control showed that after VAMP implementation, the rate was 9.1/1000 line days. The primary goal of this study is to compare CRBSI rates in pediatric CV surgery patients before and after VAMP implementation.

This is a retrospective chart review of pediatric cardiac surgery patients at Riley who underwent surgery between June 1, 2003 and May 31, 2004. Patients with a central line placed while on the CV surgery service are included and classified into the pre-VAMP group. Patients included in the infection control data are classified as the post-VAMP group. The CRBSI rate in the pre-VAMP group will be determined and compared to the post-VAMP group.

Preliminarily, 34% (63/187) of patients reviewed had a central line with an average duration of 15.7 days. The rate of CRBSI in the pre-VAMP group was 16.2/1000 line days.

Thus far, implementation of the VAMP system has shown a 44% decrease in the catheter related infection rate.

Learning Objectives:

Define catheter related bloodstream infection.

Evaluate the potential benefits of implementing the venous arterial blood management protection system.

Self Assessment Questions:

T/F Causative agents for the bloodstream infections are most commonly coagulase-negative staphylococci.

T/F VAMP implementation increased the catheter-related infection rate in the cardiovascular surgery population.

EXAMINATION OF BLEEDING RATES IN PATIENTS ON LONG-TERM TRIPLE ANTITHROMBOTIC THERAPY WITH ASPIRIN, CLOPIDOGREL, AND WARFARIN

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Background:
The use of percutaneous coronary intervention (PCI) with intracoronary stent placement has changed the way patients with coronary artery disease are managed. However, in-stent restenosis (ISR) occurs in up to 25-35% of patients with conventional bare metal stents (BMS). In recent years, the use of drug-eluting stents (DES) has shown to substantially lower the risk of ISR. There is a delayed potential for ISR after DES placement. Therefore, depending on the type of DES used, patients require combination antiplatelet therapy with aspirin and clopidogrel for 3-6 months. Some patients may also require chronic anticoagulation with warfarin for indications such as atrial fibrillation, thromboembolic disease, prosthetic heart valves, or prevention of left ventricular mural thrombus following acute myocardial infarction. Little is known about the bleeding risk associated with triple antithrombotic therapy. The purpose of this study is to examine bleeding rates associated with the use of triple antithrombotic therapy in patients undergoing PCI with DES placement.

Methods:
A retrospective chart review will be performed to compare bleeding rates in subjects receiving aspirin, clopidogrel, and warfarin (ACW) to those receiving aspirin and clopidogrel (AC). Subjects >18 years who underwent PCI with DES placement between 7/1/03-8/31/05 will be identified from cardiac catheterization laboratory records and screened for inclusion. Subjects will be stratified into two groups: those discharged home on ACW and those on AC. Patients will be excluded if they were not discharged home on both aspirin and clopidogrel and if medical records are unavailable. Data collected will include: demographics, medical and medication histories, laboratory markers, bleeding events, treatment of bleeding complications, and outcomes following bleeding events. If an increased risk is identified in the group receiving ACW, recommendations for their management may follow to minimize their risk of bleeding.

Results/Conclusions:
Results and conclusions will be presented at the GLRC.

Learning Objectives:

Identify the frequency of patients discharged on triple antithrombotic therapy after undegoing PCI with DES placement at the University of Illinois at Chicago Medical Center.

Compare the risk of bleeding among patients receiving triple antithrombotic therapy versus dual antithrombotic therapy in patients undergoing PCI with DES placement.

Self Assessment Questions:

What is the recommended treatment duration for aspirin and clopidogrel following PCI with DES placement?

Is there an increased risk of bleeding associated with triple antithrombotic therapy compared to dual antithrombotic therapy?

EFFICACY AND SAFETY OF HIGH-DOSE STATINS VS. COMBINATION THERAPY FOR LIPID-LOWERING

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Background:
The recent update to the ATP III Guidelines suggests a target LDL-C of less than 70mg/dL in patients considered very high-risk. The basis of this new recommendation originates from two large clinical trials which suggest that there is no threshold LDL-C for which no further risk reduction occurs. One modality for reaching aggressively low LDL-C goals involves titrating the statin dose to reach maximum therapeutic benefit. However, statins are often not titrated to sufficient doses to achieve aggressive LDL-C goals. Moreover, the incidence of adverse of events with statins appears to be dose-dependent. A second approach for LDL-C lowering involves the addition of ezetimibe or other lipid-lowering agents to statins to reduce LDL-C to goal.

Purpose:
The objective of this trial is to retrospectively evaluate the efficacy and safety of high-dose statin therapy as compared to combination lipid-lowering therapy. Efficacy of the two lipid-lowering regimens will be determined by the percentage of subjects who reach LDL-C goal. Secondary endpoints will include the percent change from baseline LDL-C to study endpoint, incidence of myopathy and/or rhabdomyolysis and change in hepatic transaminases from baseline to study endpoint.

Methods:
A retrospective chart review will be undertaken at the University of Illinois Medical Center at Chicago. Data will be collected for all adults >=18 years of age who are on high-dose statins or combination lipid-lowering therapy and have baseline lipid data. Data collection will occur at baseline, 1-4 months and 6-12 months after initiation of therapy. Subjects will be separated into the high-dose statin group or the combination lipid-lowering therapy group and then further divided into risk categories with target LDL-C goals based on the updated NCEP Guidelines. Statistical analysis will be performed to determine any differences between the two groups.

Results and conclusions will be presented at the GLPRC.

Learning Objectives:

Compare the efficacy of high-dose statins vs. combination lipid-lowering therapy for achieving LDL-C goals

Evaluate the risks associated with high-dose statins as compared to combination lipid-lowering therapy

Self Assessment Questions:

Compare the effectiveness of high-dose statins to combination lipid-lowering therapy for achieving LDL-C goals.

Explain the risks associated with high-dose statins as compared to combination lipid-lowering therapy.

ASSESSMENT OF TIME REQUIRED FOR PHARMACISTS TO CONDUCT MEDICATION HISTORIES

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Objective: Current practice within most health care facilities is for the nurse to perform the medication history upon admission. An accurate medication history is a critical element of the patient assessment on admission to the hospital. An incomplete medication history may result in failure to detect the primary diagnosis, drug-related problems and potentially lead to interrupted or inappropriate drug therapy during hospitalization. Multiple studies have shown that pharmacist performed medication histories were more accurate and more complete when compared with physician and nurse obtained histories. Errors that can be prevented by adopting a pharmacist-managed reconciliation process include screening for inadvertent omission of needed home medications, failure to restart home medications following transfer or discharge, and duplicate therapy. The objective of this project is to assess the time requirements for pharmacists to obtain medication histories and develop practice guidelines for pharmacist-performed medication histories.

Methodology: Establish a team composed of decentral staff pharmacists that will be responsible for obtaining the medication histories. The pharmacists will take part in pre-pilot and pilot collection periods. The pre-pilot is designed to assess the current time spent by pharmacists performing drug clarifications, reconciling medication discrepancies, and allergy clarifications. Pharmacists will use random pagers to document time spent clarifying orders for a period of one week. During the pilot, pharmacists will obtain medication histories on new admissions to the floor while continuing to perform their normal daily pharmacist duties. Data will be collected at two hospitals to obtain an N of 160. Pharmacists will document on special forms the time needed specifically to obtain the med history and/or to reconcile any discrepancies. The data from both the pre-pilot and pilot will be analyzed and be used to assess the feasibility of pharmacists routinely obtaining medication histories in their daily workflow.

Learning Objectives:

Demonstrate the value of a pharmacist performed medication history and assess time requirements by pharmacists to obtain med histories.

Develop practice guidelines for pharmacist-performed medication histories

Self Assessment Questions:

Multiple studies have shown that pharmacist performed medication histories are more accurate and more complete when compared with physician and nurse performed medication histories? (T/F)

List errors that can be prevented by adopting a pharmacist-managed reconciling process?

CLINICAL OUTCOMES OF PATIENTS ON CLOPIDOGREL WITH A HEMORRHAGIC EPISODE

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With the incidence of stroke, coronary artery disease and peripheral vascular disease on the rise, there has been increasing use of medications for primary and secondary prevention of these conditions including aspirin and the thienopyridines, namely clopidogrel. Clopidogrel inhibits platelet aggregation by preventing the binding of adenosine diphosphate (ADP) to its receptor. Recent studies have shown that clopidogrel reduces the incidence of ischemic stroke, myocardial infarction (MI) and symptomatic peripheral vascular disease however there is an associated increase in bleeding events. When aspirin and clopidogrel are used in combination, an additive antiplatelet effect occurs. This effect has been proven to decrease the occurrence of cardiovascular death, MI and urgent target revascularization in patients undergoing percutaneous coronary intervention (PCI) with stent placement. The discontinuation of clopidogrel in the setting of PCI is associated with subacute and late stent thrombosis and high mortality. The decision to continue clopidogrel during an acute hemorrhagic episode is important due the associated bleeding risks. If clopidogrel is discontinued there are thrombotic risks such as MI, stroke, subacute thrombosis and late thrombosis.

This study is a retrospective chart review of patients who have experienced a bleeding episode in the hospital while on clopidogrel. Subjects included will be 18 years and older and admitted to the University of Illinois Medical Center between July 1, 2003 through June 30, 2005. Patients will be stratified into two groups consisting of patients who had their clopidogrel continued and patients who had their clopidogrel discontinued during the hospitalization. Clinical outcomes including stroke, MI, death, and bleeding complications will be analyzed. This study will gain insight into these clinical outcomes with continued use or discontinuation of clopidogrel after an acute bleeding episode.

Learning Objectives:

To describe the risks and benefits of using clopidogrel for prevention of stroke, cardiovascular death, MI and for urgent target revascularization in patients undergoing percutaneous coronary intervention with stent placement.

To examine the clinical outcomes, including stroke, thrombosis, and bleeding complications of patients who experience a hemorrhagic episode during clopidogrel therapy.

Self Assessment Questions:

The combination of aspirin and clopidogrel has been shown to increase the risk of bleeding when compared to aspirin alone. T/F

Early discontinuation of clopidogrel in the setting of percutaneous coronary intervention is associated with subacute and late stent thrombosis. T/F

RETROSPECTIVE REVIEW TO IDENTIFY NONRESPONSE FACTORS TO DARBEPOETIN IN ONCOLOGY RELATED INDICATIONS FOR ERYTHROPOIETIC THERAPY

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Previous studies indicate that as many as one third of cancer patients with anemia, related to either chemotherapy or the disease state, do not respond to erythropoietic therapy. Many references define response as an increase in hemoglobin to greater than or equal to 12 g/dL or a greater than or equal to 2 g/dL rise in hemoglobin levels from baseline. We plan to analyze potential factors that may predict nonresponse to darbepoetin, the current erythropoietic formulary agent for our health system.

A retrospective review was conducted of oncology patients, identified by ICD-9 code via internal billing database, who received darbepoetin for from July 1, 2004 to June 30, 2005. Patients were included if they were > 18 years of age, were currently receiving or had previously received chemotherapy and/or radiation, and had received darbepoetin for at least 4 weeks. Selected baseline laboratory values were also collected. The primary outcome was to determine any potential factors that may predict nonresponse to darbepoetin therapy. A secondary outcome was the calculation of the potential cost savings to the Pharmacy department if a nonresponse factor could be predicted.

Results are pending upon the completion of data collection.

Learning Objectives:

Identify factors that contribute to anemia in cancer patients

Discuss appropriate use of darbepoetin in cancer patients with anemia.

Self Assessment Questions:

Response to an EPO agent is defined by any increase in hemoglobin from the patient's baseline. T F

A patient would be considered a non-responder to darbepoetin if there is no increase in hemoglobin by ³ 2g/dL or to ³ 12g/dL from baseline after 6 weeks. T F

EXPERIENCE WITH TIGECYCLINE IN SURGICAL INTENSIVE CARE UNIT PATIENTS WITH MULTI-DRUG RESISTANT ACINETOBACTER BAUMANNII VENTILATOR ASSOCIATED PNEUMONIA

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Purpose: Historically, multi-drug resistant A. baumannii isolates are often only sensitive to colistin, a nephrotoxic and neurotoxic antibiotic. Tigecycline is a broad spectrum glycylcycine antibiotic displaying activity against many multi-drug resistant pathogens, including A. baumannii, but currently lacks FDA approval for ventilator associated pneumonia. This study describes surgical intensive care unit patients that received tigecycline for ventilator associated multi-drug resistant A. baumannii pneumonia.

Methods: Medical records of patients who received tigecycline for multi-drug resistant A. baumannii ventilator associated pneumonia documented by culture positive bronchial alveolar lavage (BAL) were reviewed. Patient outcomes were evaluated by clinical cure defined as normalization of white blood cell count and temperature, and mechanical ventilator de-escalation. Microbiological cure is presumed or documented by isolate eradication from repeated BAL.

Results: Multi-drug resistant A. baumannii was isolated in 13 total cases through BAL and displayed resistance to beta-lactams, aminoglycosides, flouroquinolones, and carbapenems. All 13 cases were managed with tigecycline, and many included a combination of additional antibiotics: 4 cases received tigecycline with inhaled colistin, 4 cases used tigecycline as monotherapy, and 5 cases received tigecycline with imipenem and inhaled colistin. Clinical and microbiologic cure was observed in 11 of 13 and 7 of 13 cases respectively. Three patients expired during their ICU admission, 2 during therapy, and the other 14 days after completion of tigecycline and eradication of the isolate.

Conclusion: Early experience suggests tigecycline is a suitable alternative therapy to colistin in the management of multi-drug resistant A. baumannii ventilator associated pneumonia. Additional patients will be evaluated to further define the role of tigecycline.

Learning Objectives:

Identify the rationale for utilizing tigecycline for multi-drug resistant Acinetobacter baumannii ventilator associated pneumonia.

Determine the efficacy of tigecycline in relation to clinical and microbiological outcomes in patients with multi-drug resistant Acinetobacter baumannii ventilator associated pneumonia

Self Assessment Questions:

T/F Tigecycline is currently FDA approved for use in complicated intra-abdominal infections because it is highly active against Pseudomonas aeruginosa pathogens.

T/F Acinetobacter baumannii is a nosocomially acquired pathogen usually susceptible to ampicillin/sulbactam and imipenem.

RISK OF CEREBROVASCULAR EVENTS AND ALL-CAUSE MORTALITY IN GERIATRIC PATIENTS TAKING ATYPICAL ANTIPSYCHOTICS

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Atypical antipsychotics are commonly used “off-label” to treat psychosis, aggression, and agitation in the elderly. Examples of atypical antipsychotic agents are: aripiprazole, olanzapine, quetiapine, risperidone, and ziprasidone. Recently, the Food and Drug Administration (FDA) added a black-box warning to the labeling of these agents regarding the increased risk of death associated with their use in geriatric patients with dementia.

The purpose of this observational, retrospective study is to determine if exposure to olanzapine, quetiapine, risperidone, or ziprasidone increases the risk of cerebrovascular events or death compared to a population not exposed to an antipsychotic. The primary endpoint will be at least one ICD-9 coded inpatient or outpatient visit for cerebrovascular events: 430.xx, 431.xx, 432.xx, 434.xx, 435.xx, 436.xx, 438.81, 438.21, 438.22, 342.10; one admission for the aforementioned ICD-9 codes, or all cause mortality. Data will be collected from the Veterans Integrated Service Networks (VISN) 10 corporate database. Patients will be divided into two groups: those who have been exposed to a study medication and those who have not received an antipsychotic. Exposure is defined as receiving a new start of any formulation of the study medications as an outpatient from January 1, 2003 through December 31, 2003. Relative risks will be calculated to determine the ratio of risk of cerebrovascular event in exposed subjects to the risk of disease in non-exposed subjects.

If an increased risk is observed for those who are exposed to the study medication, further study is warranted to promote safe and effective use of these antipsychotic agents (given that these agents continue to be used in clinical practice). If exposure to these agents demonstrates that there may not be an increased risk of cerebrovascular events, further study is warranted to determine the legitimacy of the black box warnings of these agents.

Learning Objectives:

To explore the background leading to the FDA black-box warning of atypical antipsychotics in elderly demented patients.

To promote safe and effective use of atypical antipsychotics.

Self Assessment Questions:

List the agents reviewed by the FDA which resulted in the warning to providers.

Describe cerebrovascular event monitoring parameters caretakers should be aware of if a patient is started on an atypical antipsychotic agent.

REDESIGN AND IMPLEMETATION OF A HOME MEDICATION RECONCILIATION FORM

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The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) National Patient Safety Goals for 2005 includes the goal to “accurately and completely reconcile medications across the continuum of care.” Recognition of this goal has lead to the redesign of Aurora's current Home Medication Reconciliation Form and implementation of the form throughout inpatient care areas and appropriate ambulatory care areas across Aurora Health Care. Use of the redesigned form throughout Aurora Health Care will enable patient care providers to document and reconcile medications across multiple disciplines and multiple health care settings. A literature search was performed to assess the processes that hospitals have used to implement Home Medication Reconciliation Forms. A multidisciplinary team reviewed the current Home Medication Reconciliation Form and provided feedback regarding flaws of the current form and suggestions for its redevelopment and implementation. This feedback was used to revise the Home Medication Reconciliation Form and create a medication reconciliation policy to fit the needs of multiple departments across all Aurora Health Care facilities. The revised Home Medication Reconciliation Form is now available to all Aurora Health Care hospitals through contact with department representatives from inpatient and ambulatory care areas. These representatives were given materials as part of an educational plan, which included informational posters and newsletter articles for physician, nursing, and pharmacy staff on the proper use and benefits of the new form. A power point presentation was also supplied to nursing leadership to aid in education of the nursing staff. A 6-week time frame will be given for all nursing leadership to educate their staff. At that time, data will be collected including presence of the form in the chart, completeness of medication orders including medication name, dose, route, and frequency, and reconciliation of medications within 24 hours of admission.

Learning Objectives:

Define medication reconciliation and the role it plays in hospital admissions.

Develop an educational plan for nursing, physician, and pharmacy staff.

Self Assessment Questions:

True/false: Many medication errors occur on admission or discharge from a clinical unit/hospital when patient orders are written.

True/false: Multiple organizations such as JCAHO and IHI have created goals related to medication reconciliation during a patient's transfer of care.

DO ANTIDEPRESSANTS INCREASE THE RISK FOR GASTROINTESTINAL BLEEDING?

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Purpose:
Recent literature suggests that there may be an association between gastrointestinal bleeding and inhibition of serotonin reuptake by antidepressants. It has also been proposed that the risk for gastrointestinal bleeding increases with antidepressants having the greatest inhibition of serotonin reuptake. The primary objective of this analysis is to determine if treatment with antidepressants increases the risk of developing a gastrointestinal bleed.

Methods:
Data from patients greater than 18 years of age admitted to Methodist Hospital with a primary diagnosis of gastrointestinal bleed between January 2002 – December 2005, will be included in this analysis. Each patient's chart will be retrospectively reviewed to determine if the patient was receiving an antidepressant, the patient's concomitant medications, and the patient's concomitant co-morbid disease states. The rates of gastrointestinal bleeds among patients receiving antidepressant therapy will be compared to those who were not receiving antidepressants. The incidence of bleeding will be compared among all antidepressant agents in patients who are admitted into the hospital with a gastrointestinal bleed and are receiving antidepressant therapy. Concomitant medications will also be analyzed to identify trends in drug combinations that might further increase the risk of gastrointestinal bleeding.

Results:
Results are pending further data analysis.

Learning Objectives:

Describe the proposed mechanism between antidepressant use and gastrointestinal bleeding.

Differentiate between the risk of gastrointestinal bleeds among the various classes of antidepressants.

Self Assessment Questions:

T or F: Selective serotonin reuptake inhibitors are associated with higher rates of gastrointestinal bleeds, compared to tricyclic antidepressants.

T or F: There is no difference in the rates gastrointestinal bleeding among the various selective serotonin reuptake inhibitors.

90 DAYS SUPPLY AT RETAIL: A COMPARATIVE ANALYSIS EVALUATING THE IMPACT OF A DAYS SUPPLY GREATER THAN 35 AT RETAIL PRE/POST IMPLEMENTATION

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Introduction: Historically, the retail prescription benefit allows plan participants to receive medication in quantities sufficient to provide one month of coverage while mail order programs have traditionally dispensed quantities of up to 90 days. Recently, there has been the advent of new programs offering medication in a days supply greater than 35 at the retail setting to mirror quantities typically associated with mail. Perceived advantages of each program exist, further extending the distance between the benefits. Whether it's the face to face interaction of a pharmacist at the retail setting or the convenience of having a 3 month supply of medication delivered directly to the house, plan participants and companies have become eager to determine which program appropriately fits their needs of pharmacy benefit coverage.

Objective: The objective of this study is to compare a retail benefit that allows more than one month supply per fill to a mail order benefit that allows up to three months of supply per fill. This study evaluated key plan performance measures, impact of plan design on overall utilization, and cost.

Methods: A retrospective database analysis of prescription claims involving a population of approximately 25 million lives was conducted to identify plans that offered a retail benefit of greater than one month supply per fill. Performance of these retail plans was benchmarked against traditional mail order programs. Plan performance metrics such as net cost per day supply, gross cost per day supply, generic substitution rate, rate of new generic uptake, and formulary compliance rates were quantified and evaluated across delivery systems.
Results: Results are still pending.

Conclusion: The final results of this study will reflect which plan design, a days supply greater than 35 at retail or traditional mail order, provides clients with the most beneficial plan design from both a health and economic perspective.

Learning Objectives:

Investigate and magnify the differences between plans offering a greater than 35 days supply at retail with a traditional mail order program

Understand the financial impact of both benefits

Self Assessment Questions:

Have I gained a better understanding of the retail 90 program

How does a retail 90 type program affect a client

MEDICATION USE EVALUATION OF EZETIMIBE FOR THE TREATMENT OF ELEVATED LOW-DENSITY LIPOPROTEIN CHOLESTEROL

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Purpose: Numerous studies have demonstrated the benefits of lowering low-density lipoprotein (LDL) cholesterol in preventing cardiovascular events including morbidity and mortality. Achieving LDL goals is often difficult with a single HMG-CoA reductase inhibitor (statin), due to the relatively small percent change in LDL that results from doubling the dose of a statin, as well as dose-related increases in myalgias and concerns of drug interactions. Ezetimibe, a new cholesterol absorption inhibitor, has been shown to significantly lower cholesterol. When ezetimibe is used in combination with HMG-CoA reductase inhibitors, LDL can be decreased by up to 20% with lower risk of adverse effects. The objective of this study is to evaluate the effectiveness of ezetimibe in achieving LDL goals in a veteran population.

Methods: A search of the pharmacy prescription database will be conducted to identify all patients receiving ezetimibe at the William S. Middleton Memorial Veterans Hospital as of January 2006. The VA Computerized Patient Record System (CPRS) will be used to collect the following data before and after treatment with ezetimibe: fasting lipid panels, liver function tests, concurrent medications, co-morbidities, refill histories of lipid-lowering medications, and adverse events. The primary outcome is to determine the effectiveness of ezetimibe, alone or in combination with other lipid-lowing therapies, in achieving LDL goals. Effectiveness will be assessed by the meeting of each veteran's pre-determined LDL goal. These goals will be identified based upon review of progress notes by a Clinical Pharmacy Specialist of each veteran's CVD risks, based on NCEP guideline recommendations. Secondary outcomes will include analysis of safety, cost, effects on other lipid parameters, and cardiovascular outcomes identified by ICD-9 codes.

Results and conclusions: pending the completion of data collection

Learning Objectives:

Understand the significance of combination therapy with ezetimibe and a HMG-CoA reductase inhibitor in reaching LDL goals.

Discuss secondary benefits (in addition to LDL lowering) of ezetimibe taken alone or in combination with another lipid lowering medication.

Self Assessment Questions:

Addition of ezetimibe to a HMG-CoA reductase inhibitor results in up to approximately what percentage LDL lowering?
A. 35%
B. 12%
C. 20%
D. 2%

Reasons for striving for an LDL goal of <70mg/dL include which of the following?
A. Diabetes
B. Previous MI
C. CAD
D. Significant Family History
E. All of the above

A RETROSPECTIVE ANALYSIS ON THE CLINICAL EFFECTIVENESS AND SAFETY WHEN VETERAN PATIENTS ARE CONVERTED FROM PIOGLITAZONE TO ROSIGLITAZONE.

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Objective of the Project
The primary objective is to evaluate the effectiveness of glycemic control by comparing HbA1c levels when patients are converted from pioglitazone to rosiglitazone. The secondary objectives include comparing safety measures such as weight gain, liver function tests, and incidence of congestive heart failure. Changes in lipid profile and fasting blood glucose will also be documented.

Research Plan
A retrospective chart review will be performed on patients who were converted from pioglitazone to rosiglitazone for approximately one year period. This study will take place at the Chalmers P. Wylie Veterans Outpatient Clinic.

Methodology
A retrospective chart review will be performed on patients at the Chalmers P. Wylie Veterans Outpatient Clinic who were converted from pioglitazone to rosiglitazone within approximately a one year period. Inclusion criteria will include patients who were switched to rosiglitazone per VA formulary change. Exclusion criteria include patients who had additions of lipid lowering medications near baseline of medication conversion or during follow up period. Baseline data such as HbA1c, lipid profile, fasting blood glucose, weight, liver transaminases, and incidence of congestive heart failure will be documented prior to and after the switch in therapy. A data collection sheet will be used to collect pertinent patient information. Approximately 20-40 patients will be included in the study. Data from the two treatment groups (pioglitazone and rosiglitazone) will be analyzed using paired t-test to evaluate for any significant differences in the change in the primary endpoint of HA1c. Secondary endpoints analyzed include percent change in glucose, TC, LDL, HDL, and TG. In addition, safety differences will be evaluated by comparing the incidence of adverse events pre and post conversion including weight gain, transaminase elevations, edema, and CHF diagnosis or hospitalizations.

Findings, Results or Conclusions Reached to Date
Not applicable at this time.

Learning Objectives:

Determine efficacy of glucose control in patients treated with rosiglitazone compared to pioglitazone.

Determine safety of rosiglitazone in patients with type two diabetes.

Self Assessment Questions:

Is there a significant difference in A1c lowering when patients are converted from pioglitazone to rosiglitazone?

What patient risk factors may be consider before starting rosiglitazone?

ASSESSMENT OF MEDICATION USE IN PEDIATRIC HEMATOLOGY / ONCOLOGY PATIENTS NEAR THE END OF LIFE: DEVELOPMENT OF A PEDIATRIC PALLIATIVE CARE PROGRAM

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PURPOSE: Little is known regarding symptom assessment and management in caring for children near the end of life. The purpose of this study is to assess medication use in pediatric hematology-oncology patients at Toledo Children's Hospital (TCH) to determine the effectiveness of symptom management near the end of life. Information will be gathered to assist in the development of guidelines and the implementation of our own pediatric palliative care team.

METHODS: Patients diagnosed with a pediatric hematologic or oncologic disease who expired between 1998 and 2005 will be included. Data will be collected retrospectively from patients' charts and computer records, and will include demographic information, diagnosis history, hospitalization requirements, hospice involvement, date of death, transplant requirements, chemotherapy and radiation therapy received, and treatments used for symptom management in both the inpatient and outpatient settings. Attainment of symptom control will be assessed through evaluating subjective reports from patients and their caretakers of comfort level and overall quality of life. Charts will be reviewed for notes indicating satisfaction, or lack there of, with care received. Objective data, such as number and frequency of hospitalizations, dosage adjustments required, pain scale, depression/anxiety scale and sedation scale assessments, frequency of emesis, and breakthrough medications used will be recorded when available. Safety will be assessed through examining reports of adverse effects that occurred during therapy.

PRELIMINARY RESULTS: Data collection is ongoing. Preliminary results have been analyzed for 10 patients. Of the 6 symptoms examined, pain and nausea/vomiting were most frequently treated while therapy for depression was least frequently seen. Seven patients were hospitalized at TCH during their last year of life, and 4 of these patients expired as inpatients. Hospice consults were obtained for 3 patients, with only 1 patient actually enrolling.

Learning Objectives:

To evaluate the efficacy of symptom management in pediatric hematology – oncology patients near the end of life.

To understand the importance of developing and implementing pediatric palliative care services within individual institutions.

Self Assessment Questions:

True / False National guidelines currently exist for providing comprehensive palliative care to pediatric patients.

The management of which of the following are NOT important to consider in end of life care for pediatric patients?
a. Pain
b. Anxiety
c. Depression
d. Dyspnea
e. None of the above

IMPACT OF THE MEDICARE PRESCRIPTION DRUG PLAN ON PATIENTS PREVIOUSLY ENROLLED IN MANUFACTURER ASSISTANCE PROGRAMS.

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Statement of Purpose

The purpose of this study is to evaluate the impact of the Medicare Prescription Drug Plan (MDP) on patients who were enrolled in pharmaceutical manufacturer assistance programs (MAP).

Methods

This study will be conducted at The Ohio State University Medical Center (OSUMC). Patients included in the study must meet the following criteria: received treatment at OSUMC; been enrolled in one or more MAP by the OSUMC Patient Assistance Program (PAP); be age 65 or greater; have no additional prescription insurance.

From the patient information obtained by the PAP, the patient's monthly income, MAP enrollment information, and list of chronic medications will be collected. For each chronic medication on the medication list, it will be determined if the PAP was able to enroll the patient in a MAP and the co-pay cost for the medication (if applicable). For medications not provided by MAPs, the retail cost of the medication will be determined. The patient's total monthly medication expenditures will be compared to their monthly income to determine the patient's monthly medication spending ratio (MMSR).

Total monthly expenditure after the implementation of MDP will be determined using the same medication list and assuming the patient will no longer be eligible for MAPs. A Medicare Drug Plan will be chosen for each patient based on the chronic medication list and annual income. Medications not covered by the MDP will be assigned retail cost. The MMSR will be determined using the medication costs, monthly premiums, deductibles and/or coverage gaps over a 12-month period.

Summary/Preliminary Results

In progress

Learning Objectives:

Describe the changes to the Medicare system as a result of the Medicare Prescription Drug Plan

Describe the potential implications of the Medicare Modernization Act on patients who were previously assisted by pharmaceutical manufacturer patient assistance programs.

Self Assessment Questions:

How does Medicare differ with the addition of the Medicare Advantage Program?

How will patients previously assisted by pharmaceutical manufacturer assistance programs, be affected by the Medicare Prescription Drug Plan?

EVALUATION OF OSTEOPENIA AS A RESULT OF LONG-TERM USE OF TOTAL PARENTERAL NUTRITION IN THE PRETERM NEONATE

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Purpose/Objective: Premature neonates frequently require parenteral nutrition (PN) for reasons that include, but are not limited to: immaturity of the gastrointestinal (GI) tract, gastroschisis, meconium or paralytic ileus, short bowel syndrome, necrotizing enterocolitis, respiratory distress syndrome, sepsis, malabsorption, and congenital malformation of the GI tract. In these patients, PN is needed to supply adequate calories and protein to prevent starvation and provide the necessary elements for ongoing physical and intellectual development. Administration of PN is not without consequences, however. One such consequence is PN-induced osteopenia, which is thought to develop due to disruption of the calcium-phosphorus supply that would normally be provided in utero during the third trimester of pregnancy. Current literature states that approximately 30 percent of premature neonates who are fed by prolonged PN develop osteopenia. The purpose of this investigation is to evaluate the rate of PN-induced osteopenia in neonates at Methodist Hospital and to determine if all interventions for minimizing osteopenia are being maximized.

Methods: This was a retrospective review with the following inclusion criteria: gestational age less than or equal to 30 weeks, birth weight less than or equal to 1500 grams, and PN feedings for fourteen days or more. Radiographic studies were evaluated for documentation of osteopenia. Pertinent demographic data were recorded, and laboratory values were scrutinized for signs of metabolic bone disease (increased alkaline phosphatase and decreased phosphorus).

Results: Twenty-four patients met inclusion criteria. At time of writing, data collection was incomplete. Once data collection is complete, our rate of osteopenia will be compared to that found in the literature. As a secondary analysis, both management of PN and monitoring patients with regard to osteopenia prevention will be evaluated.

Learning Objectives:

Discuss major reasons why osteopenia is a common complication of prolonged PN use in the preterm neonate.

Identify ways in which the incidence of PN-induced osteopenia may be reduced.

Self Assessment Questions:

True or False: Inability to solubilize adequate amounts of calcium and phosphorus in the PN solution is thought to contribute to the development of bone disease in the preterm neonate fed solely by PN.

True or False: Decreased alkaline phosphatase is a sign of metabolic bone disease.

IMPLEMENTATION OF A HEALTHY HEART OUTREACH PROGRAM: A COLLABORATIVE HEART FAILURE PROGRAM IN NW DETROIT

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Implementation of a multidisciplinary heart failure program involving community partners requires the collaboration, support, and effort of many parties including hospital administration, staff, and the community. In September 2005, Sinai-Grace Hospital received the Expecting Success: Excellence in Cardiac Care grant from the Robert Wood Johnson Foundation. The goal of the grant is to use strategies to identify ways to provide excellence in cardiac care and reduce disparities related to race, ethnicity and language. The initiative has both inpatient and outpatient goals, with requirement of a community demonstration. Based on the challenges/barriers noted in patients admitted to our institution, we began development of the Healthy Heart Outreach Program, a congestive heart failure(CHF) education and resource initiative, with the goal of stabilizing and improving heart failure classification status by overcoming socioeconomic obstacles to healthcare noted in NW Detroit.

The objective of this initiative is to implement a mobile multidisciplinary heart failure education program using a nurse, pharmacist, and social worker partnered with community organizations and primary care physicians. The multidisciplinary team will visit four different community sites, once weekly, providing CHF patient education and assisting in social needs.

Program development took place between October 2005 – January 2006. This included the hiring and orientation of staff, meetings with each community site to solidify agreements for the program, development of marketing materials and hosting a public forum to create awareness and excitement in the community. Physician visits and agreements were formed to recruit and care for the patients. The program will begin February 2006 at one site, with all four sites live by March 2006.

Data regarding the process and planning needed to develop such a program; strategies to marketing; and team dynamics/collaboration required for success will be presented. In addition, preliminary data regarding patient enrollment will also be presented.

Learning Objectives:

Identify the steps and processes required to create a community outreach multidisciplinary program.

Determine the necessary individuals and responsibilities needed to establish a multidisciplinary program.

Self Assessment Questions:

True or False – The team required to carry out the program must be hired first so that they are the only people involved in developing the program.

True or False – A collaborative community program produced by a large hospital requires the support of the hospital president, involvement of public relations and governmental affairs staff, community residents, community associations, and the multidisciplinary team required to deliver the program.

PROVIDING MEDICATION DISCHARGE EDUCATION TO PARENTS OF INFANTS DISCHARGED FROM THE NEONATAL INTENSIVE CARE UNIT (NICU): HOW MUCH INFORMATION IS RETAINED?

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Objective: Understanding of medication use, action/mechanism, dose, and side effect profile is vital to discharge success and positive health outcomes. Without medication discharge counseling, patients are at risk for poor health outcomes, including adverse drug reactions, progression of disease, and death. The objectives of this study are to 1) develop standardized education checklist tools for medication discharge counseling 2) evaluate baseline and post-discharge medication knowledge; 3) identify families receiving discharge medication counseling from other healthcare providers and assess parent/caregiver medication knowledge with standard assessment tool; and, 4) determine satisfaction with the pharmacist provided medication education.
Methodology: Between 9/27/05 and 3/31/05, Columbus Children's Hospital neonatal intensive care unit (NICU) inpatients will be provided standardized medication discharge counseling from the pharmacy. Counseling will include; medication name, dose, and schedule, missed dose instructions, length of therapy, signs of an allergic reaction, possible side effects, and importance of compliance. Families will be provided; a Lexi-comp® handout on each medication, a personalized medication administration tool, pharmacy contact information, and recipes for compounds. Families will be asked to demonstrate administration techniques. Contact information for the families will be obtained for follow-up. Baseline knowledge will be assessed by clinician interview and answers recorded on the education checklist tool. Parents/caregivers will be the primary source of medication information unless otherwise specified. Medication knowledge and satisfaction will be evaluated one month post-discharge via confidential mail survey that assesses current medications, medication familiarity, satisfaction with medication discharge education, and basic demographics.
Statistics: Patients will be used as their own control. Appropriate statistical tests will be used to assess pre and post medication knowledge scores. Satisfaction scores will be correlated with medication knowledge scores to determine if standardized education results in higher satisfaction. A chi-square test will compare the effectiveness of medication discharge education from a pharmacist versus another healthcare provider.

Learning Objectives:

To understand why medication knowledge is important

Become informed about pharmacist-based discharge medication education program

Self Assessment Questions:

What is the average baseline knowledge of families at Columbus Children's Hospital?

Are pharmacists more effective than other healthcare providers at providing medication discharge education?

ESTABLISHING CLINICAL PHARMACISTS IN A METABOLIC SERVICE

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Background: Adult parenteral nutrition support at Gundersen Lutheran is currently provided via metabolic service consults. The consult team consists of a physician and dietitian. Pharmacists at Gundersen Lutheran are responsible for preparation and dispensing of the total parenteral nutrition (TPN).

Purpose: To improve the quality of adult parenteral nutrition management by utilizing clinical pharmacists at Gundersen Lutheran.

Methods: A baseline drug use evaluation (DUE) will be performed to assess current management of adult parenteral nutrition support at Gundersen Lutheran. Patients for the DUE will be selected randomly from a list of patients who received TPN from January through August, 2005. After the baseline DUE is performed, a pharmacy adult parenteral nutrition support model will be investigated. Only patients requiring parenteral nutrition support (i.e. TPN) will be included. Patients requiring solely enteral nutrition therapy will be excluded. Using the American Society for Parenteral and Enteral Nutrition (ASPEN) guidelines as their primary resource, pharmacy will evaluate and adjust macronutrients and electrolytes on TPN patients meeting inclusion criteria. All recommendations will be verified by verbal order by the metabolic support physician or physician initially ordering the consult. Patients will be followed by pharmacy until the TPN is discontinued by the metabolic support service or primary MD. Data will be collected prospectively via a pharmacy TPN flow sheet. Patients in the study group will be evaluated using the same DUE criteria and data collection form as the control group. An analysis will be performed to identify variations and consistencies in management of adult parenteral nutrition between the control and study population. From the analysis a practice model for clinical pharmacist management of adult parenteral nutrition will be proposed.

Results/Conclusions: Data collection is in process for the pharmacy nutrition support model. Results comparing the two practice models and conclusions will be presented at the conference.

Learning Objectives:

To evaluate the current metabolic support service at Gundersen Lutheran Medical Center in terms of compliance with the American Society for Parenteral and Enteral Nutrition (ASPEN) guidelines. Identification of significant clinical variations of provider practice at Gundersen Lutheran Medical Center compared to ASPEN guidelines.

Discuss the impact and obstacles of implementing a new clinical pharmacy service. Five barriers identified for implementing a new clinical pharmacy service in a community-based teaching hospital.

Self Assessment Questions:

T or F: Blood glucose levels should be maintained in the 100 to 200 mg/dL range in hospitalized patients with diabetes mellitus.

T or F: Hypocaloric nutrition regimens with supplemental protein are recommended in the treatment of mild to moderately stressed obese patients.

INTER-RATER RELIABILITY OF A CLINICAL OUTCOME ORIENTED SEVERITY SCALE FOR ADVERSE DRUG EVENTS

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Introduction:
Adverse drug reactions and medication errors are frequently categorized according to the severity of injury they produce or have the potential to produce. The Ohio Health healthcare system has developed a tool to classify the severity of reported adverse drug events. The tool has been utilized to classify the severity of harm in events related to anticoagulants, opioids, and insulin products as part of retrospective chart reviews utilizing a modified 'trigger methodology'. Patients who have potentially experienced an adverse drug event are identified by 'triggers' such as elevated a PTT/INR or use of a reversal agent such as Narcan or Romazicon. An independent chart review is completed to determine if an adverse event has occurred. Once an adverse event had been identified, the independent reviewer utilizes the clinical outcome oriented scale to assess the severity of the identified event. Problems arise when considering the correlation of severity scores among the reviewers who utilize the validation tool.

Purpose:
The purpose of this investigation is to measure the inter-rater reliability among independent reviewers that utilize a validation tool to assess the severity of adverse drug events involving opioids, insulin, and anticoagulants.

Methods:
An expert panel of quality leaders will evaluate twelve charts and assign a severity classification representing the "gold standard". Each of the five severity categories will be represented and randomized. Independent reviewers with experience in trigger methodology and adverse event scoring will review each case report and assess the events using the developed clinical outcome oriented severity scale. Scoring from independent reviewers will be classified into categories that compare their ratings to those of the established "gold standards".

Results/ Conclusions: Forthcoming

Learning Objectives:

To determine the inter-rater reliability of clinical outcome oriented severity scale.

To discuss implications of low inter-rater reliability.

Self Assessment Questions:

Inter-rater reliability is estimated by having two or more observers review the same event and independently record variables according to a pre-determined coding system. T or F

If a severity scale possesses high inter-rater reliability, then it is a valid tool. T or F

EVALUATION OF CONTINUITY OF CARE AND HEALTH EDUCATION IN PATIENTS DISCHARGED ON WARFARIN FOR LONG-TERM PROPHYLAXIS OF STROKE AND TRANSIENT ISCHEMIC ATTACK

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Purpose: To evaluate the differences in outcomes between patients who are knowledgeable and adherent to warfarin therapy and those who are not. Also to improve patient and staff education about warfarin, in order to improve patient outcomes.

Methods: A retrospective review of patients discharged from the stroke service at University of Louisville Health Care (ULH) with a prescription for warfarin between January 2004 and August 2005 was performed. A phone interview was conducted using an interview sheet to assess patient education and adherence to therapy. Further patient and staff education was facilitated by inservices and patient correspondence, to improve adherence to therapy and patient outcomes.

Results: Of the 74 patients contacted, 30 were still on warfarin therapy. There were 86.7 percent that were highly adherent to therapy with the most common nonadherence issue of forgetfulness. Patients were monitored at either ULH or other anticoagulation clinics, including primary care practitioners. Sixty percent of patients who correctly answered 5 or more education assessment questions had therapeutic INRs while 27.3 percent and 28.6 percent of those with 3-4 or 0-2 correct answers respectively had therapeutic INRs. Of the 53.3 percent of patients who received discharge counseling, 100 percent were in the high or medium adherence category with one trip back to the ER or hospital due to a stroke or bleeding. In the group with no discharge counseling, 92.8 percent had high or medium adherence levels with one trip back to the ER or to the hospital.

Conclusions: The rate of discharge counseling for warfarin should be improved, with increased involvement from pharmacy services in order to increase patient education and adherence to therapy. Ongoing efforts include further patient and staff education as well as development of recommendations to the ULH.

Learning Objectives:

Explain the importance of appropriate therapy with warfarin

Discuss the steps to be taken to improve patient education and outcomes with warfarin therapy.

Self Assessment Questions:

True or false: Cardioembolic stroke represents 20% of all ischemic strokes in the U.S. and the annual incidence is estimated at approximately 125,000 cases.

True or false: Only 24-55% of patients who are candidates for anticoagulation receive therapy.

EVALUATION OF LIVER EFFECTS ASSOCIATED WITH DULOXETINE IN HOSPITALIZED PATIENTS

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Background/Objective: Duloxetine was introduced in August of 2004 as a new treatment for both depression and the pain associated with diabetic peripheral neuropathy. In October 2005, The Food and Drug Administrations published a letter from Eli Lilly concerning the potential for hepatic injury associated with duloxetine use, which resulted in new labeling. In the letter, the company reported a 0.9% incidence of alanine aminotranseferase (ALT) elevations greater than 3 times the upper limit of normal in the major depression controlled trials, and 1.68% in the diabetic peripheral neuropathy trials. Although there have been no case reports of fulminate hepatic failure published to date, cases of hepatitis with liver enzymes up to 20 times the upper limit of normal and cholestatic jaundice have been reported and are on file with the manufacturer. While hepatic injury has been associated with duloxetine, the risk has yet to be fully characterized in a broader range of patients and dosages. The objective of this study is to evaluate the incidence of liver function abnormalities in hospitalized patients admitted on or started on duloxetine therapy while hospitalized. Concurrent medications will be identified to determine any increased risk of hepatic effects associated with combination therapy.

Methods: A retrospective review from September 2004 to January 2006 was performed in patients receiving duloxetine at The Ohio State University Medical Center. Patients were identified through the nonformulary request database and through the Health System's Information Warehouse. Patients were included if information was available indicating a start date of duloxetine and at least one liver function panel was obtained following initiation of duloxetine.

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

Learning Objectives:

Identify the incidence of liver enzyme elevation associated with duloxetine in hospitalized patients.

Identify risk factors associated with elevated enzymes and determine any potential requirements for monitoring high risk patients.

Self Assessment Questions:

Which liver indices are monitored for drug induced hepatotoxicicty:
A. ALT
B. AST
C. Bilirubin
D. All of the above

Duloxetine is a substrate for which of the Cytochrome P450 isoenzyme(s)?
A. CYP 2D6
B. CYP 3A4
C. CYP 1A2
D. All of the above.

USE OF METRONIDAZOLE IN THE SETTING OF A CLOSTRIDIUM DIFFICILE OUTBREAK: PHYSICIAN PRESCRIBING PRACTICES AND OPINIONS

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Background: Clostridium difficile (C. difficile) associated diarrhea is the most frequent cause of antibiotic associated colitis and accounts for 15-20% of antibiotic associated diarrhea. Fatal complications of C. difficile associated colitis include toxic megacolon and colonic perforation. Currently many cities in the United States are experiencing outbreaks of C. difficile. A significant outbreak of C. difficile has occurred at the Louis Stokes Veterans Affairs Medical Center (LSVAMC), with approximately 20 documented cases per month. The Society of Healthcare Epidemiology Association, American Journal of Gastroenterology, and the American Society of Health-System Pharmacists have published guidelines for the treatment of C. difficile associated colitis. Anecdotal reports within our institution indicate that metronidazole is being utilized as a prophylaxis and as inappropriate empiric treatment for C. difficile before assays are obtained. Duration of therapy is also thought to be inconsistent. Current guidelines do not support prophylaxis or empiric therapy with a low clinical suspicion as appropriate indications for metronidazole use.

Objectives: The objective of this study is to describe the inpatient use of metronidazole at our institution in the setting of a C. difficile outbreak in comparison to published recommendations for treatment. Physician opinions regarding the treatment of C. difficile colitis will also be assessed.

Methods: The study will be conducted as a prospective observational chart review in conjunction with a concurrent practitioner survey. All inpatients with an order for metronidazole between December 2005 and February 2006 will be included in the chart review with a target enrollment of 100 patients. Appropriateness of therapy will be determined by the use of a treatment algorithm developed with the Infectious Disease staff at the LSVAMC. During the same three-month period, inpatient practitioners will be surveyed through case scenarios on their opinions regarding C. difficile treatment.

Results: In progress.

Learning Objectives:

Define the guidelines for treatment of an initial infection of C. difficile colitis.

Describe physician opinions regarding the treatment of C. difficile colitis.

Self Assessment Questions:

T or F: All patients with loose stools and antibiotic treatment within the previous two months should be treated empirically for C. difficile colitis.

T or T: Three weeks of metronidazole 500mg orally three times daily is an appropriate duration of therapy for C. difficile colitis treatment.

IMPLEMENTATION OF AN INFLUENZA AND PNEUMOCOCCAL VACCINE CLINIC FOR SICKLE CELL PATIENTS AND THE IMPACT ON HOSPITALIZATIONS

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Sickle cell patients represent a unique population in the health care community. With the increased life expectancy among sickle cell patients, the need for ongoing care extends into the realm of preventative health maintenance. Prevention of acute infections, whether viral or bacterial, becomes important in the medical treatment of these patients as it may help avoid hospitalizations. The primary objective of this project is to implement an influenza and pneumococcal vaccine clinic and assess its impact on hospitalizations in the sickle cell population.

Approval for this study has been attained from the University of Cincinnati Institutional Review Board. Patients with sickle cell disease to be included in the study were identified through patient lists at the Barrett Cancer Center. Clinic dates for vaccination were scheduled for October 7, 11, 14, 18, 21, 26, and 28th. Patients were encouraged to be vaccinated through letters, posters displayed throughout the Barrett Cancer Center, and through medical staff interactions during routine clinic visits. Through review of patient clinic records and interviewing by medical staff, the need for pneumococcal vaccination was assessed for each patient. Those patients with unknown vaccination status or prior vaccination greater than 5 years ago were immunized with Pneumovax-23Ò. All patients were immunized with the current influenza vaccine pending no contraindications to immunization. The primary outcome to be assessed in this study is the number of hospitalizations and the use of antibiotics during the study period. This data will then be compared to each patient's previous hospitalizations and antibiotic use for the previous year. The affect on length of hospital stay will also be included in the analysis.

During the immunization period, 56 patients were immunized through clinic visits. Data collection is currently occurring to gain retrospective data on previous hospital admissions and vaccination status as well as prospective data on new hospitalizations.

Learning Objectives:

Identify the organism that causes high morbidity and mortality rates in children and infants with sickle cell disease.

List three precipitating infectious factors for the development of the acute chest syndrome in sickle cell patients.

Self Assessment Questions:

T/F: Invasive Streptococcus pneumoniae infections have high morbidity and mortality rates in children and infants with sickle cell disease.

T/F: Less than 5% of patients with reported acute chest syndrome have associated the onset with bacterial, viral, mycoplasma, or chlamydial infections.

PREDICTIVE FACTORS FOR IFOSFAMIDE-INDUCED NEUROTOXICITY IN PATIENTS WITH SOFT TISSUE SARCOMAS

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Ifosfamide is an oxazaphosphorine alkylating agent used to treat patients with unresectable locally advanced or metastatic soft-tissue sarcoma. It is a racemic mixture of R- and S-enantiomers that undergoes hydroxylation to yield ifosforamide mustard and acrolein and dechloroethylation to yield chloroacetaldehyde. Chloroacetaldehyde is responsible for the neurotoxic adverse effects seen with ifosfamide. Neurotoxicity is more common at higher doses (>5 grams/m2) and has been associated with risk factors such as renal failure, female gender, and route of administration. Management of neurotoxicity includes discontinuation of ifosfamide, supportive care, and administration of antiepileptics if necessary. There has been literature to suggest the use of methylene blue, an electron acceptor, in the prevention and treatment of ifosfamide neurotoxicity. Nonetheless, a large percentage of patients without identifiable risk factors still develop ifosfamide neurotoxicity. A better understanding is needed to establish a relationship between the incidence of neurotoxicity and the patient and chemotherapy characteristics.
This is a retrospective case study in patients with soft-tissue sarcomas who received ifosfamide-containing chemotherapy regimens between January 2000 and December 2004 at the University of Illinois Medical Center at Chicago (UIMCC). The goal of the study is to identify risk factors for the development of ifosfamide-induced neurotoxicity in patients with soft-tissue sarcoma and determine the role of methylene blue in the management of neurotoxicity associated with ifosfamide. A total of seven patients with neurotoxicity following treatment with ifosfamide were identified from adverse event reports. This study will compare patient characteristics (age, sex, performance status), treatment characteristics (dose, schedule, administration, and duration), and laboratory characteristics (albumin, serum creatinine, and electrolytes) between these seven patients who developed ifosfamide induced neurotoxicity and fourteen patients who did not develop neurotoxicity. The fourteen subjects will be randomly chosen among all patients who received ifosfamide for soft-tissue sarcoma during the study period. Data analysis is ongoing.

Learning Objectives:

To evaluate the relationship between patient and chemotherapy characteristics and the incidence of ifosfamide neurotoxicity

To discuss the role of methylene blue in the management of ifosfamide neurotoxicity

Self Assessment Questions:

Development of neurotoxicity from ifosfamide is associated with acrolein, the metabolite produced through the hydroxylation metabolic pathway. T or F

Methylene blue is an electron donor that is used in the prevention and treatment of ifosfamide induced neurotoxicity. T or F

IMPLEMENTATION AND EVALUATION OF AUTOMATIC COMPUTERIZED DRUG INTERACTION SCREENING IN AN ACADEMIC MEDICAL CENTER

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Objective: The University of Wisconsin Hospital and Clinics (UWHC) pharmacy order entry system's drug interaction screening program, Ultimedex,® was originally not set to screen orders automatically. The program did allow pharmacists to screen the entire profile for drug interactions, but this was not an automatic function, and was only performed at the pharmacists' discretion. The Department of Pharmacy Services transitioned to automatic computerized drug interaction screening in January of 2006. Pharmacists' ability to detect and intervene on drug interactions before and after activation of the automatic computerized screening function will be compared.

Methods: The screening sensitivity that was used was “major” interactions with “good” documentation. For the seven days immediately prior to automatic drug interaction screening implementation, this screening was run manually on the majority of UWHC patients. After this data collection period was completed, automatic screening was initiated. For the following fourteen days, a report was generated listing all drug interaction warnings that were generated, and the pharmacists' reaction to the warnings, overriding the interaction or acknowledging it. The total number of drug interactions will be compared between the two data collection periods. As secondary endpoints, the rates of drug interactions for each unit and each hospital service will be compared. The ten most common drug interactions will be determined, and rates of these interactions will then be compared. In order to collect feedback after implementation of the automatic screening, a survey will be distributed to evaluate the pharmacists' perception of the program and its effects on patient care and work flow.

Results: Results will be presented to the UWHC pharmacy department and will demonstrate the impact of implementing automatic drug interaction screening upon potential drug interactions among hospitalized patients in the institution.

Learning Objectives:

To describe the impact of automatic computerized drug interaction screening upon the number of potential drug interactions for patients at UWHC.

To discuss pharmacists' perceptions of the automatic drug interaction screening upon patient care and work flow.

Self Assessment Questions:

What were the most common drug interactions detected by the Ultimedex® drug interaction screening during the study?

The rate of existing drug interactions at UWHC was lower after the implementation of automatic drug interaction screening. T/F

EVALUATION OF AN AUTOMATED CAROUSEL DISPENSING TECHNOLOGY WITH INTEGRATED INVENTORY MANAGEMENT SOFTWARE ON CENTRALIZED DRUG DISTRIBUTION

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Background: Rising overall health care costs and a focus toward increasing patient safety have health care organizations searching for ways to reduce costs without compromising safety. Pharmacy departments strive to find more efficient ways to dispense medications often using technical labor and automation to reallocate pharmacist time to provide direct patient care. Automated dispensing technologies were developed to increase dispensing efficiency and accuracy while maintaining or reducing the labor requirements needed in a manual medication distribution system. The University of Wisconsin Hospital and Clinics pharmacy department utilizes centralized automated dispensing technologies to fill, distribute, and restock first dose medications, decentralized automated dispensing cabinets, and clinic areas. The pharmacy department also uses technician labor to maintain medication inventory levels and remove expired medications from the current stock.

Objective: The objective of this evaluation is to measure the impact of carousel dispensing technology with integrated inventory management software on pharmacy technician labor, workflow efficiency, first dose dispensing accuracy, on-hand medication inventory carrying costs, and inventory turns.

Methods: Using pre- and post-implementation data we plan to evaluate the effect carousel dispensing technology has on the medication distribution process. Using direct observation methods, we will measure the amount of time a technician spends pulling medications for batch automated cabinet fills, patient specific first doses, manual cart fill doses, returns, receipts, and inventory management ordering. Medication turn around time for first dose antibiotics and STAT medications will be collected to measure the impact of carousel dispensing technology. In addition, pre- and post-implementation data will be analyzed to measure medication dispensing efficiency and accuracy. Lastly, we will evaluate how this technology impacts full-time technical labor requirements in an automated distribution system versus a manual medication distribution system.

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

Learning Objectives:

Explain the process and challenges encountered when implementing carousel dispensing technology.

Identify and compare distribution efficiencies gained or lost when utilizing carousel dispensing technology.

Self Assessment Questions:

List the inventory management benefits are realized when using carousel dispensing technology with integrated inventory management software?

How can carousel dispensing technology improve compliance with medication management standards and enhance patient safety?

EXPLORING OPTIONS ASSOCIATED WITH CREDENTIALING ONCOLOGY PHARMACISTS

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Objective: Oncology pharmacy is an area of practice that is highly specialized and requires advanced knowledge. A pharmacist's knowledge of oncology-related issues can help prevent unnecessary adverse effects and lead to improved outcomes. The objective of this project is to develop an institutional-based framework for credentialing pharmacists as a way to recognize pharmacists with advanced knowledge of chemotherapy and ancillary medications used in oncology. This credentialing status would identify pharmacists with oncology expertise who could serve as resources for other staff members.

Methods: A literature search was performed to identify published cases of institutions educating and credentialing pharmacists in the area of oncology. These institutions were contacted to inquire about their processes. Other institutions similar in size to our institution were also contacted for the same purpose. Information collected included institution size, number of oncology beds, number of inpatients and outpatients receiving chemotherapy, use of competencies focusing on oncology, and the institution's credentialing system. This information was shared with pharmacists working in our oncology unit to solicit feedback on the direction and feasibility of credentialing at our institution. Potential barriers were identified and solutions proposed. Since chemotherapy can be prescribed anywhere in our institution, a competency for all pharmacy staff was developed that encompasses the processing of chemotherapy orders and addresses basic oncology issues. The competency will serve as a starting point for pharmacists to pursue the oncology credentialing. Ongoing sessions with pharmacists working in our oncology unit will be held to discuss the implementation of our institutional-based oncology credentialing system. The nature, requirements, and reassessment of oncology credentialing will be determined as the credentialing process develops.

Learning Objectives:

Differentiate between competency and credentialing.

Recognize the barriers to implementing an institutional-based credentialing system.

Self Assessment Questions:

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.

True or False: One potential barrier to implementing an institutional-based credentialing system is concerns that pharmacists credentialed in a specialty area may lose clinical skills required to work in other areas.

DEVELOPMENT AND JUSTIFICATION OF UTILIZATION PHARMACIST POSITION IN AN ACADEMIC MEDICAL CENTER

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The purpose of this project is to develop and justify a medication utilization pharmacist position in a 426-bed academic medical center. The goal of introducing this position is to improve patient care while decreasing healthcare costs. This will be accomplished by reducing adverse drug effects, improper drug utilization, and mismanagement of clinical disease states.

The utilization pharmacist position description and qualifications were developed. A review of the current role of medication utilization pharmacists at other institutions provided a baseline model to build position responsibilities. Boundaries will be set defining the range of practice for this position within clinical, administrative, and educational aspects of the pharmacy department. These boundaries will quantify cost-savings and cost-avoidance after the introduction of this position. The development of utilization tools to monitor medication use trends, adverse drug reaction reporting, and costs to patients and the medical center will allow the utilization pharmacist to analyze, intervene, and improve pharmaceutical care. Data collection will be used for development, alteration, or education of current policy within the pharmacy department or at the medical center. The utilization pharmacist will provide education to healthcare staff to better streamline therapy for patients.

Justification of this position will be completed by examining cost-savings and cost-avoidance from proper utilization of intravenous to oral medications, antibiotic selection, drug toxicity avoidance, and improved prescribing habits in medications that have opportunities for intervention. The utilization pharmacist will become an active member on medical center committees. Reassessment tools for long-term justification of this position will be necessary for continued benefit and cost-savings to the pharmacy department and medical center.

The utilization pharmacist position has been filled and further development and justification of the position will be presented at the Great Lakes Pharmacy Residency Conference.

Learning Objectives:

Discuss how the process of position development occurs for a utilization pharmacist position.

Identify how a clinical information system can be used to assist the expansion of the utilization pharmacist role.

Self Assessment Questions:

A utilization pharmacist position will bring additional cost-savings to an academic medical center. T/F

There are multiple ways a utilization pharmacist can benefit disciplines other than the pharmacy department within the academic medical center. T/F

COMPARISON OF EFFICACY, SAFETY AND COST OF GLARGINE INSULIN WHEN SWITCHING FROM NEUTRAL PROTAMINE HAGEDORN (NPH) INSULIN IN TYPE 2 DIABETICS

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Background: Diabetes is a chronic disease that is associated with multiple macrovascular and microvascular complications. Type 2 diabetes is characterized by insulin resistance with progressive beta-cell dysfunction in the pancreas. Patients initially may be treated solely with oral medications. However, eventually exogenous insulin therapy may be required in order to maintain glycemic control and prevent/minimize long-term complications. NPH is commonly used as initial basal insulin dosed once or twice daily. The disadvantages of NPH is the pronounced peak experienced between 4 to 10 hours after administration, the 10 to 16 hour duration of action, and the variable absorption rates. Glargine is a newer formulation of long-acting, basal insulin. In pharmacokinetic and pharmacodynamic studies, glargine demonstrated a peakless, long duration of action (almost 24 hours). When compared to NPH, glargine had decreased intrasubject variability. Also, the incidence of nocturnal hypoglycemia was decreased where the efficacy remained comparable.

Purpose: The purpose of this investigation is to evaluate the use of glargine insulin within the diabetic population at Jesse Brown VA Medical Center.

Methods: This investigation will be a retrospective chart review of Type 2 diabetic patients who have been converted from NPH to glargine between 01/01/02 to 06/01/05. A computerized patient list will be generated to include Type 2 diabetic patients who have ever received a prescription for glargine. Data will be collected from patients' who are eligible per inclusion/exclusion criteria. This study will be conducted within a two year time frame: patient medical records will be examined for up to one year prior to switching to glargine and for up to one year after. Evaluation of discontinuation of glargine will be assessed up to 06/01/05.

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

Learning Objectives:

Determine the efficacy when switching from NPH to glargine

Evaluate the safety profile of glargine

Self Assessment Questions:

What is glargine insulin's mechanism of action?

What is the dose conversion when switching from NPH to glargine?

DEVELOPMENT AND IMPLEMENTATION OF A MANAGED CARE DIABETES MANAGEMENT PROGRAM UTILIZING COMMUNITY PHARMACISTS AS CARE PROVIDERS

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Background:
Unity Health Insurance is an HMO which is expanding their diabetes disease state management services by sponsoring a pilot project utilizing community pharmacists as disease management coaches. The project is based on other cognitive services programs which have demonstrated improved clinical, humanistic, and financial outcomes both over a short-term (six months) and long-term (1-5 year) basis.

Purpose:
The goals of the Unity program are two-fold: 1) to improve quality and cost of care for patients with diabetes enrolled with Unity Health Insurance through a community pharmacist-based diabetes disease state management program, and 2) to demonstrate quality improvement in diabetes care as defined by HEDIS quality measures.

Methods:
Design: A multicenter, unblinded randomized controlled trial. Setting: Five community pharmacies in Madison, Wisconsin affiliated with an academic medical center. Patients and Other Participants: One hundred diabetic patients with Unity Health Insurance who had a hemoglobin A1C greater than or equal to 7.5%, receiving care within the University of Wisconsin Health System, were randomized into the standard of care (SOC) or the treatment group. Community pharmacists completed an APhA accredited diabetes certificate program provided the clinical services and received reimbursement for their services. Interventions: Patients had monthly consultations with pharmacists over a 12 month period. Pharmacists provided self-management diabetes education, explanations for goals in treatment, medication management, and communications to patient's endocrinologist and primary care provider.

Main Outcome Measures: Data collection occurs at 3, 6, and 12 months. At 3 months: assessment of response and non-response analysis, retention and non-retention, percent of patients receiving hemoglobin A1C, and annual eye examinations. At 6 and 12 months: data analysis includes change from baseline hemoglobin A1C at six and 12 months for comparison to control groups.

Results/Conclusions:
Data collection is in progress. Study results will be submitted to a peer reviewed journal for publication.

Learning Objectives:

Describe the potential impact on care for patients with diabetes meeting monthly with a community pharmacist.

Discuss the barriers to pharmacists in providing care for patients enrolled in a diabetes disease state management program.

Self Assessment Questions:

The pharmacist's role in this study is to provide the patient with new information regarding their diabetes management. T or F?

What is the role of the pharmacist in supplementing the traditional diabetes care provided by physicians and Certified Diabetes Educators?

ENDOTOXIN MEASUREMENT AS A MARKER FOR BOWEL ISCHEMIA AND RELATED ADVERSE OUTCOMES IN CRITICALLY ILL PATIENTS

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Purpose
Endotoxin is a lipopolysaccharide found in the cell walls of gram-negative bacteria. Gram-negative bacteria are part of the indigenous flora of the gastrointestinal tract. Gastrointestinal stasis can lead to the proliferation of these endogenous bacteria. Patients admitted to the intensive care unit (ICU) are often intubated and unable to eat, predisposing them to gastrointestinal stasis, villi atrophy, bowel dysfunction and ischemia. The circulatory abnormalities typical in critical illness and sepsis may further depress the gastrointestinal tract's normal barrier function, allowing translocation of bacteria and endotoxin into the systemic circulation. Providing early enteral nutrition (EN) may reduce the risk of developing bowel atrophy, bacteria translocation and the resulting endotoxemia. Circulating endotoxin may serve as a marker for identification of patients with impaired gut barriers and bacterial translocation. The purpose of this prospective pilot study is to determine if endotoxin concentrations are elevated in critically ill patients with a high risk for bowel ischemia. Additionally, this study will attempt to determine if EN affects the concentration of endotoxin in this high-risk subset of patients.

Methods
This study is a prospective, randomized pilot trial. A total of 60 patients between 18 and 80 years of age at high risk for bowel ischemia will be enrolled (20 patients with marked abdominal distention, 20 with severe head injury, and 20 receiving high dose vasopressors). Blood samples will be obtained Days 0, 1, 2, 3, 5 and 7 and endotoxin concentrations assayed. Initiation of EN will be recorded. Outcome parameters including infections, ventilation days, days in the ICU and hospital length of stay will be measured. Decreases in endotoxin concentrations with the initiation of EN will be considered favorable. The relationship between endotoxin concentrations and outcome parameters will be assessed.

Results are pending.

Learning Objectives:

Identify patients at high risk for bacterial translocation.

Describe a potential use of measuring circulating endotoxin concentrations in critically ill patients.

Self Assessment Questions:

T/F Gram-negative bacteria containing endotoxin are part of the indigenous flora of the gastrointestinal tract.

T/F Providing early enteral nutrition to critically ill patients may reduce their risk for bacterial translocation.

DEVELOPMENT OF A COMMUNITY-WIDE AND HOSPITAL-BASED PHARMACY RESPONSE PLAN FOR PANDEMIC INFLUENZA

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Purpose: The purpose of this project is the development of a community-wide and hospital-based pharmacy response plan for pandemic influenza.

Methods: A pharmacy pandemic planning taskforce was assembled for Northeast Indiana. This group works with the local health department to develop a community-wide pharmaceutical response plan for pandemic influenza, in accordance with recommendations from the CDC, Homeland Security, the State Department of Health and other organizations. Members of this committee include the county health commissioner, various health department employees, district supervisors of local community pharmacies, pharmacy management of local hospitals, representation from the Medical Reserve Corps, and a pharmacy practice resident. The role of project coordinator is the primary responsibility of the resident. The taskforce has four focus groups including communication/education, pharmaceutical cache, community pharmacies, and pharmaceutical distribution within a mass casualty treatment center. A group leader is assigned to each focus group and reports to the project coordinator. Monthly planning sessions are held to discuss and assess the progress and recommendations of each subcommittee. The project coordinator is responsible for the organization of information from the focus groups and development of the finalized pandemic response plan.

Preliminary Results: To date, responsibility has been disseminated to members of the various focus groups and the plan from each subcommittee has been drafted.

Conclusion: Recommendations from the pharmacy pandemic planning taskforce will be used to develop a community-wide influenza pandemic response plan. The goal date for finalization of this plan is the spring of 2006.

Learning Objectives:

Identify key issues to be addressed by an influenza pandemic response plan.

Understand the pharmacists' role in a community-wide emergency response model.

Self Assessment Questions:

Pharmacists are needed to assist the planning of a community's response to an influenza pandemic (T/F).

Coordination of care among area hospitals is not needed to provide patient care in the event of an influenza pandemic (T/F).

CAN NEBULIZED FUROSEMIDE BE USED FOR DYSPNEA IN CANCER PATIENTS?

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Purpose: Drug information services provided at Grant Medical Center are the responsibility of all pharmacist staff, including pharmacy residents. Per physician request, the use of nebulized furosemide to treat dyspnea in terminally ill cancer patients not responding to traditional therapy was researched. The purpose of this study was to review the current scientific literature in order to establish the clinical benefit and dosing parameters of nebulized furosemide for dyspneic terminally ill cancer patients.

Methods: A comprehensive literature search was performed using the Pub Med engine with the following search keywords: lasix, furosemide, nebulized furosemide, nebulized lasix, dyspnea, cancer, treatment. Once relevant articles where identified and retrieved, a literature review was performed. This process involved analyzing, evaluating, and synthesizing scientific evidence derived from studies identified through the search process.

Results: The literature search revealed a total of five clinical trials and three case reports that specifically addressed the use of inhaled furosemide in cancer patients. Other articles addressed the effect of this treatment modality in pulmonary diseases and the development of dyspnea in cancer patients. The specific findings related to these articles will be discussed during the Great Lakes Pharmacy Resident Conference.

Conclusions: In terminally ill cancer patients refractory to standard dyspnea therapy, inhaled furosemide may be considered as an option. The dosing regimen that has shown the most promise for these patients is 20 mg of furosemide diluted in 2 ml of saline and inhaled over 10-20 minutes four times a day. The Cancer Dyspnea Scale (CDS) may be used to evaluate the symptoms of dyspnea before and after starting inhaled furosemide therapy. This non-standard therapy is not suitable for patients with severe obstruction of the central airway, or with complete atelectasis due to lack of airflow to peripheral airways where the furosemide presumed to act.

Learning Objectives:

To identify the clinical benefits of nebulized furosemide for dyspnea in terminally ill cancer patients.

To identify appropriate dosing parameters of nebulized furosemide for dyspnea in terminally ill cancer patients.

Self Assessment Questions:

T or F. The drug of choice for treating dyspnea in cancer patients is inhaled furosemide.

T or F. Inhaled furosemide helps improve dyspnea by affecting dyspneic breathing patterns.

ADHERENCE TO NATIONAL HIV TREATMENT GUIDELINES IN HIV TREATMENT NAÏVE PATIENTS RECEIVING THEIR CARE AT AN ACADEMIC CENTER

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Background:
The development of Highly Active Antiretroviral Therapy (HAART) has revolutionized the treatment of persons with human immunodeficiency virus HIV) by significantly reducing morbidity and mortality. The guidelines for the treatment of persons with HIV have evolved over time with advancing research. The Panel of Clinical Practices for Treatment of HIV convened by the Department of Health and Human Services (DHHS) develops these guidelines based on new scientific evidence to provide clinicians with an outline for the appropriate use of antiretroviral agents.

Objective:
The purpose of this study is to evaluate the adherence to national HIV treatment guidelines for antiretroviral naïve patients by physicians at an academic medical center with regards to initial treatment regimens prescribed and whether therapy was initiated or deferred appropriately based on immunologic (CD4) and virologic (viral load) markers.

Methods:
A retrospective chart review of all new treatment naïve subjects seen at UICMC HIV outpatient clinic during the last 3 years. Patients will be identified by using data set from a pre-established database in clinic. Data will be collected in newly diagnosed patients to identify if appropriate treatment was initiated based on current guidelines at the time and if therapy was initiated or deferred based on immunologic (CD4) and virologic (viral load) markers. Inclusion criteria include HIV positive individuals at least 18 y/o seen at UICMC and naïve to antiretroviral therapy. Pregnant women will be excluded. We will use the data to determine the trends in the prescribing of antiretroviral agents over time and determine reasons for deviation from current recommendations. We will use descriptive statistics including means and frequencies to analyze the data.

Results: Data will be presented at the Great Lakes conference

Conclusions: To be determined

Learning Objectives:

To identify preferred regimens for the initial treatment of HIV infection in treatment naïve patients in the US

To recognize patient specific factors that need to be addressed prior to initiation of antiretroviral therapy

Self Assessment Questions:

Which of the following protease inhibitors is recommended as a preferred regimen based on clinical data in treatment naïve patients?
a. Lexiva® (fosamprenavir)
b. Viracept® (nelfinavir)
c. Kaletra® (lopinavir/ritonavir)
d. Crixivan® (indinavir)

Based on the results of this study, patient non-adherence was the most common cause of physician deviation from current national HIV treatment guidelines. (T/F)

ADVERSE EVENTS ASSOCIATED WITH PENTOBARBITAL COMA IN ADULT PATIENTS WITH TRAUMATIC BRAIN INJURY

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Background:
Pentobarbital coma is often used in patients with refractory intracranial hypertension following traumatic brain injury (TBI). While pentobarbital is effective in decreasing intracranial pressure (ICP), adverse events, including deleterious effects on hemodynamic parameters, are commonly associated with its use.

Purpose:
The primary objective of this study is to evaluate the occurrence of adverse events when using pentobarbital therapy in patients following TBI. As a secondary objective, clinical outcomes will be assessed.

Methods:
A retrospective chart review was performed on consecutive patients, age 18 years or older, who received pentobarbital for TBI from August 1, 2002 through December 31, 2005. Significant adverse drug events were defined as a decrease in systolic blood pressure (SBP) below 90 mmHg, the need for added or increased vasopressor support, a 10% or greater decrease in cardiac index (CI) of baseline, or the occurrence of an arrhythmia. The effects on BP and CI were evaluated for the first 24 hours following pentobarbital initiation, while the effect on cardiac rhythm was evaluated for the duration of pentobarbital coma.

Results:
Preliminary results from 8 patients show that all patients experienced an adverse event. While no patient had a SBP < 90 mmHg, 2 patients required a fluid bolus and all 8 patients required increased (n=6) and/or added (n=4) vasopressor support in order to maintain optimal perfusion pressure. Five patients had a decrease in CI and no patients experienced an arrhythmia. One patient survived, with good neurologic recovery.
Conclusions: Adverse events secondary to pentobarbital therapy following TBI are common. Clinicians should be familiar with these events in order to anticipate their occurrence and implement appropriate corrective drug therapy.

Learning Objectives:

Describe the prevalence of adverse events occurring with the use of pentobarbital coma for traumatic brain injury.

Discuss the benefits and risks associated with pentobarbital coma.

Self Assessment Questions:

There is literature to support the use of pentobarbital coma in patients with traumatic brain injury as a first line agent. True or False

List 2 side effects that may occur with pentobarbital coma.

ROSIGLITAZONE EFFECTS AND SAFETY IN A VETERAN POPULATION: A RETROSPECTIVE ANALYSIS

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Background: The prevalence, complications, and costs of type 2 diabetes are increasing. It is essential to use effective and safe therapies. Rosiglitazone has criteria for use and is the primary thiazolidinedione at the Madison VA. When added to other therapies, A1c decreased in a dose-dependent manner with rosiglitazone compared to placebo. Rosiglitazone and pioglitazone have similar efficacy on glucose, but various effects on lipids have been documented. Whether effects are transient or have clinical significance is not well-established. Thiazolidinediones are also associated with possible heart failure and liver concerns.

Purpose: The effects of rosiglitazone on blood sugar control and lipid parameters will be identified and analyzed. The safety and discontinuation of therapy will be examined. The goal of this project is to further establish the role and monitoring of rosiglitazone at the Madison VA.

Methods: The first 150 patients based on randomization that meet inclusion without any exclusion criteria will be selected for this retrospective chart review. Data through one year after starting rosiglitazone will be collected from the Computerized Patient Record System. Data to collect include demographics, duration of diabetes, pertinent medical history, medications, specific labs, if and why rosiglitazone was discontinued, and time from baseline. Descriptive statistics will be used. The primary outcome will be change in A1c from baseline. Secondary outcomes include percentage of patients reaching A1c <7%, number and percentage of patients stopping rosiglitazone in the first year, and reasons for discontinuing. Subset analyses will be performed separately for oral agents only and insulin at baseline. Patients with baseline fasting lipids will be included in subset analyses of effects on cholesterol and triglycerides.

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

Learning Objectives:

Identify the effects of rosiglitazone on A1c and lipid parameters.

Identify concerns of using thiazolidinediones.

Self Assessment Questions:

TRUE or FALSE. Rosiglitazone can be most often expected to reduce A1c by 1.2-2%.

TRUE or FALSE. Rosiglitazone is associated with a more favorable lipid profile than pioglitazone.

IMPLEMENTATION OF PHARMACY SERVICES TO A HEART FAILURE CLINIC

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Background
Heart failure is the most common reason for readmission in patients older than 65. Thirty-three percent of heart failure readmissions are due to dietary and medication non-compliance. Heart failure management teams result in dcreased hospital admissions, improved quality of life, and improved dosing of medications according to current heart failure guidelines. Few studies have evaluated the benefit of adding a pharmacist to the heart failure management team.
Objective
Establish the role of a clinical pharmacist in a heart failure clinic
Methods
A pharmacist was present in the heart failure clinic 1 afternoon per week. A random sample of patients taking at least 5 medications were included in the project. A complete medication history was taken for all new patients and updated for all return patients. Compliance was assessed using the Morisky compliance survey and random pill counts. Patients' understanding of drug therapy was evaluated by verbal questionaire. A concurrent chart review was conducted to assess readmission rates. Documentation of all pharmacist interventions was also recorded. Prescriber adherence to current heart failure guidelines was assessed. The project was submitted to the Institutional Review Board for approval.
Results
Data collection is ongoing and outcome data will be presented at the Great Lakes Pharmacy Resident Conference.

Learning Objectives:

Identify 2 benefits of pharmacist presence in a heart failure clinic.

List 2 ways a pharmacist can improve patient compliance with medications.

Self Assessment Questions:

True or False heart failure is the most common reason for hospital admission in patients older than 65.

True or False 33% of heart failure readmissions are due to medication and dietary non-compliance.

COST-BENEFIT ANALYSIS OF PHARMACIST INTERVENTIONS AND MEDICAID REIMBURSEMENT IN PEDIATRIC TRANSPLANT PATIENTS

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Objective: Effective medication therapy management is a challenge for many patient populations. Current literature indicates pharmacists' contributions in ambulatory settings have maximized clinical benefits and reduced negative outcomes in several disease states. Studies have been performed to assess pharmacists' impact in primary care, hypertension clinics, renal clinics, and other areas, but few studies have evaluated pharmacists' involvement in the pediatric clinic setting. The objective of this study is to measure clinical and economic outcomes of a pharmacist's involvement in medication therapy management of pediatric transplant patients.

Methodology: A pharmacist provides pharmaceutical care to transplant clinic patients including: laboratory monitoring, patient/parent/caregiver medication counseling, compliance assessments, and creation of patient-specific medication calendar to document medication administration or a medication schedule to track current medication doses and frequencies. Time spent monitoring, counseling patients, and preparing calendars is documented as well as interventions made by the pharmacist. Recipients of Wisconsin Medicaid are identified to track possible reimbursement for pharmaceutical care. Interventions are validated by another pharmacist as beneficial, somewhat beneficial but may have no effect on outcome, or potentially harmful. Pharmacist time and salary will be compared with Wisconsin Medicaid reimbursement rates and prevented errors for the cost-benefit analysis. Nurses and physicians involved will be asked to evaluate pharmacist visits with patients and time spent on medication-related activities to evaluate the pharmacist's impact on time spent with patients. Outcome Measures include: medication interventions, Wisconsin Medicaid reimbursement for pharmaceutical care, and the pharmacist's preparation time and time spent in transplant clinic.

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

Learning Objectives:

Identify the clinical benefits of pharmacist involvement in a pediatric transplant clinic.

Identify the economic outcomes of pharmacist involvement in a pediatric transplant clinic.

Self Assessment Questions:

True or False: There is an economic benefit of having a pharmacist in a pediatric transplant clinic.

True or False: There is a service benefit of having a pharmacist in a pediatric transplant clinic.

IMPLEMENTATION AND EVALUATION OF PHARAMCIST PRESENCE ON ICU ROUNDS AT AURORA SINAI MEDICAL CENTER (ASMC)

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Recognition of the unique pharmacokinetic and pharmacodynamic characteristics of critically ill patients and the increased potential for adverse drug effects (ADEs) to occur in these patients has prompted changes in pharmacy services in many intensive-care units (ICU). Several hospitals have revised pharmacy services specific to the ICU to include a pharmacist on ICU rounds. It has been demonstrated that the addition of a pharmacist on multidisciplinary rounds has reduced ADEs, decreased drug costs and provided continuity in individualizing drug therapy. Currently at ASMC, pharmacists do not consistently round with the ICU medicine team. The objective of this project is to optimize clinical pharmacy services and improve care for the medical ICU patients at this 200-bed community teaching hospital by establishing routine pharmacist participation during ICU medical teaching rounds.

A core group of pharmacists, who are assisting in implementing the project, have met regularly to provide feedback and for education on current critical care pharmacy practices. Education has consisted of pharmacist-lead topic discussions on subjects including sedation/analgesia, neuromuscular-blocking agents, and stress ulcer prophylaxis. The project objectives were presented to the Critical Care Committee and ICU teaching attending physicians/nursing staff. The core group of pharmacists will round with the medical ICU team for two months. During this interventional period, pharmacist clinical interventional data will be collected for four weeks. This data will document pharmacist activities related to patient care, such as kinetics consultations and medication safety. Cost avoidance by pharmacists, for example from IV to PO conversions, will also be calculated. This data will be analyzed to determine the potential qualitative and drug cost impact ASMC pharmacists can have on patient care by optimizing pharmacy services in the ICU.

Learning Objectives:

To identify strategies for optimizing pharmacy services for the medical ICU patients at a community teaching hospital.

To evaluate the potential impact of pharmacist rounding in the ICU at Aurora Sinai Medical Center based on qualitative and cost measures.

Self Assessment Questions:

True or False There is literature that supports that pharmacist attendance on medicine rounds in the ICU may improve patient care and safety.

Participation on ICU medical team rounds may allow the pharmacist to:
a. Quickly understand patient status
b. Develop relationships with healthcare professionals
c. Provide faster communication of drug therapy recommendations and interventions
d. All of the above

UTILIZATION OF A PHARMACY RESIDENT TO IMPROVE PRESCRIBING PRACTICES OF HEMATOPOIETIC AGENTS IN A HOSPITAL-BASED ONCOLOGY CENTER

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Background: In patients receiving chemotherapy, co-morbid conditions may develop such as chemotherapy-induced anemia (CIA) and neutropenia. If not treated appropriately, they can adversely affect patient outcomes and quality of life (QOL).

CIA is a complication associated with patients who are receiving chemotherapy and is related to fatigue, arising from low hemoglobin levels. Patients can be treated for anemia, thus, decreasing their need for blood transfusions and improving QOL. Darbepoetin alfa and epoetin alfa are the erythropoietic medications used to treat CIA and studies suggest that both agents are therapeutically equivalent.

Neutropenia is a complication seen in patients receiving myelosuppressive chemotherapy. It is associated with an increased risk of infection and is a contributor to cancer related morbidity. Filgrastim and pegfilgrastim are two of the granulocyte colony stimulating factors used to manage neutropenia. These agents help increase white blood cell (WBC) counts, decrease the duration of neutropenia, days of hospitalization, and the number of culture-confirmed infections. Studies also suggest that both agents are therapeutically equivalent.

Due to the financial impact of these medications, facilities have had to implement protocols for hematopoietic agents and establish therapeutic interchange criteria.

Purpose: Evaluate appropriate prescribing and monitoring of hematopoietic agents in a hospital-based oncology center and ensure optimal patient outcomes.

Methodology: A retrospective chart review will be conducted at a hospital-based oncology center on patients treated with hematopoietic agents from January 2005-July 2005. Appropriate prescribing and monitoring habits will be evaluated and compared to NCCN guidelines on the treatment of CIA and neutropenia. The standardized chemotherapy order sheets from the Oncology Center will also be compared to NCCN guidelines.

Results/Conclusions: Data collection is in progress and results will be analyzed upon completion. Results and conclusions will be presented at the Great Lakes Residency Conference.

Learning Objectives:

Review established guidelines in the treatment of CIA and neutropenia.

Review the agents used to treat CIA and neutropenia and the cost impact on a hospital-based oncology center.

Self Assessment Questions:

What is the first-line treatment for a patient with CIA?

True or False: Both filgrastim and pegfilgrastim stimulate the production, maturation and activation of neutrophils and cause neutrophils to increase both their migration and cytotoxicity.

LEVERAGING TECHNOLOGY WITHIN A HEALTH SYSTEM TO REENGINEER PHARMACY INVENTORY MANAGEMENT

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Background
Parkview Health, located in north-eastern Indiana, is a health system comprised of a 575 bed, central campus in Fort Wayne as well as five community hospitals approximating 225 beds, each of which are approximately 30 miles from the central campus. In May of 2004, the Parkview Pharmacy Department implemented system-wide technologies, including the support of an electronic medical record, bar-coded medications, automated carousels for drug storage and retrieval, inventory management software, unit dose packaging systems and profiled Pyxis machines. Implementation of these technologies has advantages, such as optimizing “on-hand” inventory, streamlining the daily ordering process, supporting a decentralized or “cart-less” medication distribution model and increasing labor efficiencies through centralization.

Purpose
The purpose of this project is to quantify the value of these technologies.

Methods
The method by which each outcome is assessed depends upon the individual technology. For example, the assessment of inventory management is based upon a number of factors, including: “on-hand” inventory, inventory turns, waste, and labor hours to maintain system functionality. An assortment of metrics has been utilized in this assessment; each of which is highly specific to the technology being analyzed.

Results/Conclusions
The results of this project are pending, with completion anticipated in April 2006.

Learning Objectives:

Develop an understanding of the necessity for assigning a value (monetary, man-hours, etc) to technology implementation within a pharmacy department.

Develop a general working knowledge of how the value of the various technology implementations at Parkview Health has been quantified.

Self Assessment Questions:

How does a “cart-less” medication distribution model affect “on-hand” inventory values?

How does the implementation of medication bar-coding technology affect pharmacy labor?

VENOUS THROMBOSIS PROPHYLAXIS IN INPATIENT BARIATRIC SURGERY:
A RETROSPECTIVE, COHORT EVALUATION

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BACKGROUND: Obese patients undergoing bariatric surgery are at high risk of developing venous thrombosis events (VTE) due to many risk factors. There have been documented deaths from pulmonary embolism and also documented deep vein thrombosis events in patients after bariatric surgery. Currently, there are no existing guidelines for the prevention of thromboembolic events specifically in these morbid obese patients. General surgery guidelines exist in which therapy is specified according to placement in one of the following three groups: low, moderate and high-risk. However, there is no clear evidence that these guidelines are effective in this special population of obese patients.

PURPOSE: To assess the current use of VTE prophylaxis therapy in patients undergoing inpatient bariatric surgery.

METHODS: This retrospective, cohort study will assess existing medical records of patients in whom Roux-en-Y gastric bypass surgery was performed between January 1, 1999 and June 30, 2005. Information collected will include patient demographics, type of bariatric surgery, admission and discharge date, date and time of surgery, length of surgery, type and dose of prophylaxis. Thromboembolic events, major bleeding complications, occurrence of mortality and other adverse events will also be noted. Data will be analyzed using descriptive statistics and compared to the current general surgery guidelines for VTE prophylaxis.

RESULTS/CONCLUSIONS: pending

SIGNIFICANCE: This retrospective study will help give more insight on VTE prophylaxis use, including type, dose, duration, efficacy and safety. Data collected may also aid in the development of specific guidelines for VTE prophylaxis in patients undergoing inpatient bariatric surgery.

Learning Objectives:

To evaluate current use of VTE prophylaxis therapy for inpatient bariatric surgery.

To assess efficacy and safety of VTE prophylaxis therapy in inpatient bariatric surgery.

Self Assessment Questions:

What is the incidence of VTE in patients undergoing inpatient bariatric surgery?

What VTE prophylaxis is currently being used in bariatric patients at this institution?

PERFORMANCE IMPROVEMENT MEASURES FOR VENOUS THROMBOEMBOLISM PROPHYLAXIS IN MEDICALLY ILL PATIENTS.

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Purpose. The aim of this project is to develop tools to enhance venous thromboembolism (VTE) risk assessment and prophylaxis prescribing behaviors for non-surgical, non-obstetric patients in a medium-sized community hospital.

Methods. Two interventions were made to improve identification of at-risk patients and prophylaxis. First, the hospital's VTE guidelines were revised to include recent recommendations from the American College of Chest Physicians. The guidelines include a decision tool that helps evaluate patient potential for thromboembolic events based on individual factors, such as concomitant disease states or recent procedures. A composite risk score directs prescribers to choose appropriate mechanical and/or chemical prophylactic therapies. Second, an admission order form which referenced the hospital VTE prevention guidelines was created to prompt physicians to assess and prophylax patients early in the hospital stay.

Data was collected both before and after the introduction of the admission form and revised guidelines in order to assess the impact of the interventions. A retrospective review of all non-surgical, non-obstetric patients admitted to the hospital over a two-month time period was conducted in order to collect baseline data. The appropriateness of VTE prophylaxis within the first 24 hours of hospital admission was determined by a comparison with hospital guidelines, and a similar records review was conducted after initiation of the new form.

Results. It is hypothesized that the combination of a frequently-used order form and an evidence-based assessment tool will improve proper VTE prophylaxis rates of medically ill hospitalized patients.

Conclusion. While a multitude of data exists to support the use of prophylactic antithrombotic regimens, routine inpatient use is still suboptimal. Formal VTE risk-assessment tools facilitate appropriate prescribing of prophylactic therapies, and incorporation of routine VTE assessment into daily practice, such as admission order-writing, improves prescribing rates.

Learning Objectives:

Identify individual factors that put hospitalized patients at risk for venous thromboembolism.

Describe interventions that may improve identification of patients at risk for venous thromboembolism and prophylaxis prescribing behaviors for non-surgical, non-obstetric hospitalized patients.

Self Assessment Questions:

Which of the following contributes to venous thromboembolism risk? A. Immunization status B. Environmenal exposure C. Thyroid replacement therapies D. Central venous access

Which of the following is a characteristic of an intervention that is likely to improve venous thromboembolism prophylaxis prescribing behaviors? A. Complicated B. Frequently-used C. Ambiguous D. Expensive

EVALUATION OF ENOXAPARIN USE FOR DVT PROPHYLAXIS IN BURN PATIENTS USING ANTI-FACTOR XA ACTIVITY

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Background: Burn patients are at significant risk for the development of DVT. However, there is insufficient data to guide pharmacologic prophylaxis in this population. Complicating this issue is the potential for the pharmacokinetics of LMWHs to be altered in burn patients. Despite this lack of prospective information to guide therapy, LMWHs are currently used for DVT prophylaxis in burn patients.

Purpose: This study will examine the pharmacokinetics and anti-thrombotic effects of two commonly employed prophylactic enoxaparin regimens in burn patients.

Methods: The study will enroll thirty adult burn patients admitted to the Wishard Memorial Hospital Burn Unit and in whom an order for DVT prophylaxis with either subcutaneous heparin or enoxaparin is written (orders written for heparin will be automatically converted to enoxaparin). At the time of enrollment, subjects who meet inclusion/exclusion criteria will be stratified based on % total body surface area burned. Following stratification, subjects will be assigned to receive either subcutaneous enoxaparin 30 mg every 12 hours or 40 mg every 24 hours. The pharmacokinetics of enoxaparin will be approximated using anti-factor Xa activity which will be assessed both at baseline and after seven days of therapy. Plasma will be collected from 0-12 hours for every 12 hour dosing, and from 0-24 hours for every 24 hour dosing. Estimates of pharmacokinetic parameters, including volume of distribution at steady state, systemic clearance, maximum plasma activity, time to maximum plasma activity, and terminal elimination half-life will be obtained. Standard pharmacokinetic equations will be used to calculate secondary parameters of interest including area under the anti-factor Xa activity-time curve which will be used as a measure of enoxaparin exposure. Other study endpoints will include incidence of DVT/PE and complications.

Results/Conclusions: Research is in progress. Results and conclusions will be presented at the conference.

Learning Objectives:

Describe the rationale for DVT prophylaxis in burn patients.

Describe the role of anti-factor Xa monitoring in DVT prophylaxis with enoxaparin.

Self Assessment Questions:

Pharmacologic DVT prophylaxis is recommended in all burn patients. T or F

The pharmacokinetics of enoxaparin can be potentially altered in burn patients. T or F

THE BLOODY TRUTH: DOES EPTIFIBATIDE CAUSE MORE BLEEDING THAN TIROFIBAN?

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Purpose: A potentially serious complication of GPIIbIIIa inhibitors is bleeding. If severe enough, bleeding can increase length of hospital stay, complicate the patient's current status, or even cause death. Prior to July 2005, within Riverside Methodist Hospital, only 17% of patients undergoing percutaneous coronary intervention received eptifibatide verses 80% who received tirofiban. In August 2005, to reduce time and labor involvement, eptifibatide was added to floor stock in the catheterization labs. Since that time, the use of eptifibatide has steadily increased. Coincidently, the frequency of bleeding complications has increased. Due to these events and their potential severity, it was necessary to evaluate the matter further. The primary purpose of this review is to evaluate the current incidence of bleeding complications with tirofiban and eptifibatide in patients undergoing percutaneous coronary intervention. Additionally, appropriateness of dosing and the impact of concurrent antiplatelet medications were evaluated.

Methods: A retrospective review of patient records, percutaneous coronary intervention reports and laboratory results was conducted from October 2005 through January 2006. Patients included in this analysis were those patients undergoing percutaneous coronary intervention, who received tirofiban or eptifibatide and reported a bleeding complication. Bleeding complications were confirmed by ultrasound or by chart documentation. Data collected included: age, sex, pre- and post-procedure labs, pre- and intra-procedure medications including: aspirin, clopidogrel, heparin or heparin derivatives, and bivalrudin, dose and duration of GPIIbIIIa therapy, type of bleeding complication and intervention. All data was consolidated and entered into a Microsoft Excel database for analysis. The data collected will be used to identify any difference in occurrence of bleeding complications between tirofiban and eptifibatide.

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

Learning Objectives:

To understand the pathophysiology of GPIIbIIIa inhibitors.

To determine the incidence of bleeding complications while receiving eptifibatide or tirofiban.

Self Assessment Questions:

The concurrent use of antiplatelet therapy and GPIIbIIIa inhibitors increases the risk of bleeding complications; however, is necessary due to the benefit of reducing thrombotic complications. T or F

One advantage of eptifibatide versus tirofiban is that there are no renal dosing adjustments necessary when giving eptifibatide. T or F

ASSESSMENT OF PATIENT OUTCOMES SUBSEQUENT TO USE OF NON-FORMULARY STATIN MEDICATIONS WHEN FOLLOWED BY A CLINICAL PHMARMACIST VERSUS USUAL CARE

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Background:
Cardiovascular disease (CVD) has been the number one killer in the United States annually for over a century, and is associated with increased healthcare costs. The literature has demonstrated favorable results with regard to patient outcomes for pharmacist-managed clinics versus care provided by other practitioners within the primary care setting.

Objectives:
The primary objective of this study is to compare outcomes for patients taking a non-formulary statin when followed within a pharmacist-managed lipid clinic compared to “usual” primary care. “Usual” primary care is defined as management provided by any prescribing practitioner other than a pharmacist. The primary efficacy endpoint will be the percent of patients in each group achieving LDL goal after intervention.
Secondary objectives are to determine whether there is a difference in overall 10-year coronary heart disease (CHD) risk percent, as defined in the NCEP ATP III report, absolute change, and percent change in total cholesterol, triglycerides, LDL, and HDL between the two groups.

Methods:
Patients between the ages of 18-89 years with a non-formulary statin approved by the Lipid Clinic between September 1, 2004 and April 30, 2005 were identified. A total of 50 individuals were randomly selected for each cohort, and a retrospective review of the medical record was conducted. For patients to be included in the pharmacist-managed group, lipid follow-up must have been provided entirely by the Lipid Clinic. For a patient to be included in the “usual care” group, management must have been carried out exclusively by non-Lipid Clinic practitioners. Patients were excluded if baseline serum triglycerides exceeded 500 mg/dL, the non-formulary statin was approved by anyone other than the Lipid Clinic, or if there were active orders for any other hyperlipidemic agent on the medication profile.

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

Learning Objectives:

Summarize the NCEP ATP III Guidelines for determination of LDL goal.

Examine possible benefits for patient outcomes with regard to pharmacist-managed outpatient clinics.

Self Assessment Questions:

T or F: The pharmacist-managed lipid clinic was able to bring patients to LDL goal in less time than non-pharmacist practitioners.

Which of the following patient outcomes improved for those followed within a pharmacist-managed clinic versus “usual care:”
a. Achievement of LDL goal
b. Reduction in 10-year CHD Risk %
c. Reduction in triglycerides
d. None of the above

DURATION OF STRESS ULCER PROPHYLACTIC THERAPY IN CRITICALLY ILL PATIENTS

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Background: Within hours after experiencing a critical illness, intensive care unit (ICU) patients may begin to develop gastric stress ulcers. Consequently, up to 39% of patients not receiving stress ulcer prophylaxis (SUP) develop bleeding complications resulting in lengthened hospitalization and increased mortality. Therefore, the use of prophylactic pharmacological therapy has become standard of care. Nevertheless, results from a well designed study conducted by Cook et al suggest that ICU patients who are not intubated for at least 48 hours or do not have an underlying coagulopathy may not require pharmacological SUP. As a result, SUP is not indicated indefinitely for all patients who have suffered from critical illness. However, the number of patients who continue to receive SUP once the indication for their use has been removed remains unknown. This practice of over-prescribing SUP may expose patients to unnecessary drug costs and toxicities.

Objective: The purpose of this study is to determine whether or not re-evaluation of SUP prescribing is routinely conducted as the patient's stressors or indication for use decrease. The results of this study will indicate the degree of over-prescribing of SUP at the University of Wisconsin Hospital and Clinics (UWHC).

Methods: All patients admitted to the UWHC medical/surgical ICU during a three month period were evaluated for study eligibility. Patients less than 18 years of age, died within 24 hours of ICU admission, or currently diagnosed with gastrointestinal bleed were excluded. Initial documentation involved recording an indication for SUP and medications prescribed. The final review involved documenting whether or not SUP has been prescribed and remains indicated for each subject upon discharge using the UWHC's computerized record.

Results/Conclusions: Data collection is in process. Preliminary results will be presented.

Learning Objectives:

Assess appropriateness of initial SUP therapy based on University of Wisconsin Hospital and Clinics (UWHC) SUP prescribing guidelines.

Determine the number of critically ill patients who remain on SUP upon discharge from the UWHC without a clear indication.

Self Assessment Questions:

T/F Stress Ulcer Prophylaxis should be prescribed for all patients admitted to an intensive care unit within 24 hours of admission.

T/F The only potential impact of prolonged stress ulcer prophylaxis is increased cost to the patient.

THE ECONOMIC BENEFITS OF A MEDICATION THERAPY MANAGEMENT SERVICE (MTMS) IN TWO COMMUNITY PHARMACIES

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Purpose: To evaluate the economic benefits of a MTMS for the payer, patient and pharmacy.

Methods: Patients at two community pharmacies with SeniorCare or Medicare Part D prescription drug coverage who met the subsequent criteria were eligible to be included in the study: newly discharged from a hospital or skilled nursing facility within 14 days, non-compliant for at least three consecutive months, or meeting at least two of the following conditions: > 3 chronic disease states, > 4 chronic medications, receive prescriptions from > 2 prescribers, or spend > $180 per month on medications. Patients were asked to participate in the study during a routine consultation. Half of the SeniorCare patients were randomly assigned to receive either a face-to-face MTMS consultation or a complete medication review based on the patient's refill history at the pharmacy without the patient being physically present. Patients with Part D prescription drug coverage who met the inclusion criteria and refused to pay for the pharmacy's MTMS served as the control group. Secondary endpoints include examining medication therapy changes and the type of pharmacist interventions and their outcomes.

Preliminary Results: Both that patients and payers are economically benefiting from MTMS through switching a patient on a brand name or non-formulary medication to a less costly therapeutically equivalent alternative. Patient education and provision of a compliance-aid or plan were implemented to increase compliance for non-compliant patients. The correct doses and directions were verified with prescribers for patients with difficulty understanding the directions. Both of the latter interactions improved patient care and prevented potential future complications. Claims for pharmaceutical care services have increased in both pharmacies.

Preliminary Conclusion: Not only is a MTMS economically beneficial for all three parties, it also improves the quality of patient care, helps prevent avoidable problems and increases pharmacist job satisfaction.

Learning Objectives:

Describe how Medication Therapy Management Services (MTMS) is integrated into a community practice setting.

Explain five major components of MTMS.

Self Assessment Questions:

How is a MTMS benefiting the patient, payer and pharmacy?

What type of patients will mostly likely benefit from a MTMS?

COMPUTERIZED PRESCRIBER ORDER ENTRY: AN EVALUATION OF ELECTRONICALLY FLAGGED MEDICATION ORDERS FOR INPATIENTS IN A VETERAN AFFAIRS MEDICAL CENTER

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Adverse drug reactions (ADRs) account for up to 41% of all hospital admissions per year. Among the preventable ADRs, the majority of the errors occurred at the ordering stage of medication processing. In an effort to reduce ADRs, many institutions have implemented a computerized prescriber order entry system (CPOE). The veteran affairs medical center is one of the institutions that implemented this system. CPOE is a system that allows handwritten prescriptions to be replaced with electronic orders, which are inputted directly by the prescriber. Then the order is screened by a pharmacist for potential errors or problems such as allergies, wrong drug, dose, directions, etc. If an error is detected, the pharmacist will flag the order and an alert will appear for the prescriber to respond. The implementation of a CPOE system has shown to decrease medication errors, length of stay, and consequently decrease the overall cost of care. Despite the prevention of potential ADRs, the CPOE system has also shown to cause errors such as fragmented displays and inflexible ordering formats.

Purpose: The purpose of this study is to evaluate the incidence of flagged orders and to assess the types of errors that have occurred.

Methods: The study will be conducted using data available from November 1, 2004 to October 31, 2005. Data will be obtained from the 'Order' file with the assistance of the North Chicago Veterans Medical Center Information Resource Management (IRM). This file retains all the electronic medical record orders for each patient. From that file, IRM will sort the data in Microsoft Excel by provider entry, when the order was entered, who flagged the order, who unflagged the order, reason for the flag, and the reason for the unflagging the order. The sorted data provided by IRM will not contain patient-identifiable information.

Learning Objectives:

To measure the incidence of orders flagged by the inpatient pharmacists.

To assess the number and type of orders flagged by ward location, prescriber, pharmacist, and reason.

Self Assessment Questions:

T or F: There is a correlation between specific prescriber, ward location, and or the pharmacist with the incidence of flagged orders.

T or F: There is an increased prevalence of flagged orders during specific times of the year.

IMPACT OF A PHARMACIST IN THE EMERGENCY DEPARTMENT

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Participation of pharmacists in multidisciplinary teams has been shown to reduce adverse drug events (ADEs), improve patient outcomes, and reduce hospital costs. Pharmacy services are not always uniformly available to all patient care settings. Currently, a small number of hospitals include a pharmacist in the emergency department (ED) healthcare team.

The purpose of this project was to determine the impact a pharmacist had on improving the quality of patient care and reducing costs. An eight week pilot was conducted from November 1 – December 23, 2005. A pharmacist provided services in the ED for eight hours per day, Monday through Friday. Roles of the pharmacist included; clinical consultation, order screening, dispensing medications, preparation of and stocking medications, resuscitation response, patient and staff education, and coordination of care. An ED staff survey was distributed before and after the pilot to assess satisfaction with pharmacy services. The appropriateness of antimicrobial therapy for community acquired pneumonia (CAP) and the length of time from patient registration to the administration of antibiotics was collected prospectively. Inclusion criteria included all patients who presented to the ED during the pilot. The pharmacist documented all interventions as a way to quantify the impact of providing these services. Data from the pilot will be compared to historical controls from November 1 through December 31, 2004. .

The number of, and costs associated with, preventable ADEs were extrapolated to a period of one year. The appropriateness of CAP drug therapy was determined. The length of time from patient registration to the administration of antibiotics was calculated and ED staff satisfaction was assessed.

The results obtained from the pilot will be used to expand pharmacy services to the ED.

Learning Objectives:

Discuss the impact of a pharmacist based in the ED on surrogate markers of patient care and economic outcomes.

Identify the steps that need to be taken in implementing decentralized pharmacy services.

Self Assessment Questions:

According to the report, “To Err Is Human: Building a Safer health System” published by the Institute of Medicine, emergency departments had the highest rate of preventable adverse drug events in hospitals. True/False

Decentralized pharmacy services in the emergency department can improve patient and economic outcomes, and reduce adverse drug events. True/False

EVALUATION OF ETIOLOGIC BACTERIA IN NURSING HOME ACQUIRED URINARY TRACT INFECTIONS

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Purpose: The study will attempt to determine the etiologic bacteria most frequently associated with nursing home acquired urinary tract infections at Sinai-Grace Hospital, including whether indwelling urinary catheters prior to admission impact the epidemiology. These data will help guide selection of an empiric antibiotic regimen which can optimize the appropriate spectrum of activity, minimize adverse events, and lower antibiotic costs.

Methods: Reports were generated for patients admitted to Sinai-Grace Hospital between December 2004 and December 2005 based on their diagnosis related groupings. Patients with diagnosis related groupings that include urinary tract infections were further screened for eligibility through a system-wide computer database. A retrospective chart review was conducted for each candidate admitted with a diagnosis of nursing home acquired urinary tract infection; defined as an urinary tract infection affecting a resident of a nursing home or other long-term care facilities characterized by greater than ten white blood cells per cubic millimeter of urine, a positive urine culture, and an urinary tract infection documented by an attending physician within 48 hours of admission. Patients were excluded if they were end stage renal disease requiring dialysis, without urine cultures taken within 48 hours of admission, or had urine cultures containing no organisms, multiple unidentified organisms or organisms unlikely to be the cause of urinary tract infections, such as candida species or streptococci. Data collected include: results from urine analysis, culture, and sensitivity obtained within 48 hours of admission, presence or absence of chronic indwelling urinary catheters prior to admission, empiric antimicrobial therapy, concomitant infections that required treatment, and history of urinary tract infections.

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

Learning Objectives:

List etiologic organisms most commonly causing urinary tract infections in patients from nursing homes or long-term care facilities.

Define antibiotics most appropriate for the empiric treatment of nursing home acquired urinary tract infections based on the presence or absence of chronic indwelling urinary catheters.

Self Assessment Questions:

Which antibiotics are most appropriate for the empiric treatment of nursing home or long-term care facility patients presenting with urinary tract infections?

a. Ceftriaxone
b. Piperacillin
c. Aztreonam
d. Vancomycin + Tobramycin

True or False. Empiric antibiotics prescribed for treatment of nursing home acquired urinary tract infections in patients with indwelling urinary catheters should cover enterococcus species.

ACETYLCYSTEINE FOR PROTECTION AGAINST END ORGAN TOXICITY IN HEMATOPOIETIC STEM CELL TRANSPLANT PATIENTS

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Background: Despite significant advances in supportive care, treatment-related mortality during the first 100 days after autologous and allogeneic hematopoietic stem cell transplant (HSCT) is 5-20%, respectively. End organ damage following high-dose chemotherapy and HSCT, especially of the liver, kidney, lung, and GI tract, may be mediated by free radicals and oxidative stress. Acetylcysteine, a free radical scavenger, has been used clinically to protect from reactive oxygen species, and case reports of HSCT patients suggest it may be protective against end organ damage following high dose chemotherapy and HSCT.

Objective: The objective of this study is to describe the relationship between acetylcysteine use and prevention or attenuation of transplant-related toxicity in patients undergoing HSCT.

Methods: This is a retrospective chart review of autologous and allogeneic HSCT patients who received acetylcysteine at Northwestern Memorial Hospital from September 2003 to January 2006. Acetylcysteine 100mg/kg/day was administered as prophylaxis or at early signs of end organ toxicity, including veno-occlusive disease (VOD) and graft-versus-host-disease (GVHD). Assessment of liver and renal toxicity will be measured serially during the first 30 days post transplant by the following surrogate markers: ALT/AST, bilirubin, alkaline phosphatase, and serum creatinine. GI tract, skin, neurologic, pulmonary, and cardiovascular toxicities will also be evaluated as graded by NCI criteria. Patients who received acetylcysteine will be compared to HSCT patients who did not receive acetylcysteine in relation to end organ damage.

Results: Results will be reported as a function of patient, disease, and transplant-related variables. These include age, gender, ECOG performance status, diagnosis, disease status, chemosensitivity, type of transplant, type of conditioning regimen, stem cell dose, and GVHD and VOD prophylaxis.

Conclusions are pending.

Learning Objectives:

Understand the hypothesized oxidative stress mechanism of HSCT-related toxicity.

Discuss the potential role for acetylcysteine as a chemoprotectant in HSCT patients.

Self Assessment Questions:

Decreased hepatic function prior to transplantation is an important risk factor for development of hepatic veno-occlusive disease. T or F

Conditioning regimens that include busulfan are correlated with transplant-related liver toxicity. T or F