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Category: Original

Title: Evaluation of Macrolide Use in Healthcare-Associated Pneumonia

Purpose: Macrolide-based treatment has been shown to be associated with survival benefit in hospitalized patients with community-acquired pneumonia (CAP). However, it is unclear if this benefit extends to patients with healthcare-associated pneumonia (HCAP) as well. The 2005 IDSA/ATS HCAP treatment guidelines recommend broad spectrum antibiotics for the treatment of HCAP, however, these regimens do not always contain agents such as macrolides which cover atypical pathogens. Furthermore, there is limited data available regarding the incidence of atypical pathogens in HCAP with estimates ranging from 0-35.2%. Because of this uncertainty, macrolide antibiotics are occasionally added to empiric HCAP treatment regimens. This study aims to assess if there is clinical benefit associated with this practice.

Methods: This retrospective cohort study aims to compare outcomes in patients with HCAP who were treated with antibiotic regimens with and without macrolide therapy. The control group consists of 100 HCAP patients on an anti-MRSA agent such as vancomycin or linezolid and an antipseudomonal agent such as meropenem, aztreonam, piperacillin/tazobactam, or cefepime. The treatment group consists of 50 patients treated with an anti-MRSA agent and an antipseudomonal agent and a macrolide such as azithromycin. The primary outcome is clinical improvement with secondary outcomes of hospital length of stay, ICU length of stay, and in-hospital mortality.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Marissa Chapman, PharmD

Organization: St. Luke's Hospital

Authors: Marissa Chapman, PharmD, St. Luke's Hospital; Jamie Thomas, PharmD BCPS, St. Luke's Hospital.

Category: Original

Title: Evaluation of clinical pharmacist performed comprehensive medication reviews for members of a health-system based Medicare plan

Purpose: Medicare Advantage plans that provide prescription coverage are required to establish Medication Therapy Management programs. Health-system pharmacists working in primary care clinics are well positioned to impact a health-system based plan. The primary objective of this study is to assess and evaluate the impact of face-to-face comprehensive medication reviews performed by a pharmacist through tracking pharmacist interventions by category, acceptance rate, and cost savings or cost avoidance. The secondary objectives are to evaluate the change in patient proportion of days covered, prescription drug plan costs, and hospital admissions and emergency department or urgent care visits.

Methods: This study will be submitted to the institution Human Research Protection Committee for approval. Pharmacists will perform comprehensive medication reviews at primary care offices. Pharmacists will review patient medications, gather additional history, and provide medication-related education. Pharmacists will document relevant findings and recommendations in the electronic medical record. Primary care providers will be notified of recommendations via the electronic medical records and/or verbal follow-up. Pharmacists will record the types and acceptance rates for these recommendations. Cost savings or cost avoidance associated with those recommendations will be calculated. Investigators will use health plan prescription claims data to calculate proportion of days covered and medication costs before and after the intervention. Additionally, investigators will review the electronic medical record for hospital admissions and emergency department or urgent care visits before and after the intervention. Per patient changes in 90-day proportion of days covered, annualized medication costs, and 30 and 90-day hospital admissions and emergency department or urgent care visits will be analyzed using Student's t-test. Changes in the proportion of patients with a proportion of days covered greater than or equal to 80%, with a hospital admission at 30 and 90-days, and with emergency department visit or urgent care visit at 30 and 90 days will be analyzed using chi-squared or Fisher's Exact test depending on event incidence.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Ashley Evans, PharmD

Organization: CoxHealth

Authors: Ashley Evans, PharmD, University of Arkansas for Medical Sciences, PGY2 Ambulatory Care Pharmacy Resident, CoxHealth; Stefanie Hawkins, PharmD, University of Missouri Kansas City, Pharmacy Ambulatory Care Specialist, CoxHealth; Cassie Heffern, PharmD, University of Missouri Kansas City, Ambulatory Care Residency Program Director, CoxHealth.

Category: Original

Title: Evaluation of treatment courses when vancomycin is dosed every 12 hours

Purpose: The purpose of this study is to examine the patient population that has been initiated on vancomycin with a dosing interval of 12 hours with a creatinine clearance between 50-70 ml/min in order to validate results of a previous study which identified this creatinine clearance range to be ideal for initiating an interval of every 18 hours. Methods: This study has been submitted to the internal review board. The electronic medical record system will be used to identify adult patients who have received intravenous vancomycin administered every 12 hours. All adult patients between the ages of 18 and 89 who received a dose of intravenous vancomycin administered every 12 hours between August 1, 2013 and July 31, 2016 will be eligible for inclusion. Patients over the age of 89, those on hemodialysis, those who are pregnant, patients receiving continuous infusion vancomycin therapy, patients whose vancomycin troughs were not monitored, and subsequent visits of patients who were previously on q12 vancomycin dosing will be excluded.

Methods: For the purposes of assessing primary and secondary outcomes the following patient data will be gathered: disease indication, gender, age, creatinine clearance, weight, vancomycin trough levels, number of vancomycin doses received, and milligrams of vancomycin in each dose. All data will be collected without patient identifiers and will remain confidential. Analysis will be conducted using descriptive statistics. The primary outcome will be number of patients subtherapeutic, therapeutic, and suprathereapeutic after receiving q12 vancomycin dosing based on trough levels. Secondary outcomes will include: number of patients who were mildly (21-25), moderately (26-30), or severely (>30) suprathereapeutic based on trough levels and toxicity associated with vancomycin use.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Daphne Goewey, PharmD, MBA

Organization: SSM Health St Mary's Hospital

Authors: Daphne Goewey PharmD, MBA, PGY1 Pharmacy Resident, SSM Health St Mary's Hospital, St Louis; Davina Dell-Steinbeck, PharmD, BCPS, PGY1 Pharmacy Residency Program Director, SSM Health St Mary's Hospital, St Louis; Krista Harry, PharmD, BCPS, Clinical Pharmacy Specialist, SSM Health St Mary's Hospital, St Louis.

Category: Original

Title: Safety and efficacy of enoxaparin compared to unfractionated heparin for venous thromboembolism prophylaxis in hemodialysis patients

Purpose: Enoxaparin, a low molecular weight heparin approved for prophylaxis in patients at risk for deep vein thromboembolism (DVT) and pulmonary embolism (PE) offers several advantages compared to unfractionated heparin (UFH). Dose reduction is recommended for enoxaparin in patients with renal dysfunction. Enoxaparin is not removed during dialysis and could therefore cause bleeding complications. To date, the safety and efficacy of enoxaparin for venous thromboembolism (VTE) prophylaxis has not been established for patients receiving hemodialysis (HD). 2.

Methods: A single-center, retrospective, cohort study examining patients from a 450-bed community hospital will evaluate patients who received HD and were concomitantly prescribed enoxaparin or UFH for at least two days for DVT prophylaxis. All patients admitted September 1, 2014, through October 1, 2016, will be evaluated in reverse chronological order. Patients will be excluded if they received enoxaparin or UFH for DVT treatment, were on home anticoagulation, received UFH 7500 units every eight hours or UFH 5000 units twice daily, or changed prophylaxis agents during their hospitalization. Patients will also be excluded if they did not receive dialysis, received continuous renal replacement therapy, or received peritoneal dialysis. Surgical patients and patients residing in the intensive care unit at any point during the hospitalization will be excluded. Patients will be excluded who received > 1 standard dose of enoxaparin (>40 mg). The primary outcome will evaluate a composite of major and minor bleeding defined according to International Society of Thrombosis and Hemostasis definitions from enoxaparin or UFH. The secondary outcome will evaluate occurrence of confirmed DVT or PE. Baseline demographics will be analyzed using Student's t test for continuous data and Chi-square or Fisher's exact test for categorical data. The primary and secondary outcomes will utilize Chi-square or Fisher's exact, as appropriate.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Melissa Green, PharmD

Organization: Missouri Baptist Medical Center

Authors: Melissa S. Green, PharmD, PGY-1 Resident, Missouri Baptist Medical Center; Katie B. Tellow, PharmD, BCPS, Associate Professor and Clinical Pharmacist, St. Louis College of Pharmacy, Missouri Baptist Medical Center; Amanda R. Buckallew, PharmD, BCPS Clinical Pharmacist Specialist, Missouri Baptist Medical Center.

Category: Original

Title: The Role of Hyperlipidemia in Anthracycline-Induced Cardiomyopathy

Purpose: Anthracyclines such as doxorubicin and daunorubicin in particular are known for their deleterious effects on the heart with long-term complications including left ventricular dysfunction, heart failure, and cardiovascular events. Preliminary evidence suggests 3-hydroxy-3-methylglutaryl-coenzyme A (HMG-CoA) reductase inhibitors (statins) may provide a cardioprotective role in anthracycline therapy. This study seeks to expand on current literature by reviewing patients with various malignancies on anthracycline-based chemotherapy regimens to determine the association between LDL levels and the development of clinical heart failure.

Methods: Patients who underwent antineoplastic therapy with an anthracycline were retrospectively identified for analysis. Patients were included if they were diagnosed with a malignancy and received between 200-450 mg/m<sup>2</sup> doxorubicin (or equivalent anthracycline), had a documented lipid panel within 6 months of starting anthracycline therapy, and were 18 years old or older. Patients were excluded if they received concomitant therapy with trastuzumab, received liposomal doxorubicin, had a previous diagnosis of heart failure or coronary artery disease, had a previous myocardial infarction, stroke, or transient ischemic attack, died from cancer-related complications within a year of diagnosis, were less than 18 years old, pregnant, or a prisoner. Patients were identified for analysis through a report of patients receiving anthracycline chemotherapy constructed from the electronic medical record. The study was approved by the institutional review board. Patients were divided into two groups based on LDL levels, greater than or equal to 100 mg/dL or less than 100 mg/dL. The primary outcome assessed was clinical diagnosis of heart failure. Secondary outcomes include a reduction in baseline LVEF by 15% or more, a reduction in LVEF to less than 50%, hospitalization for heart failure, myocardial infarction, transient ischemic attack, stroke, and cardiac and all-cause death.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Cora Housley, PharmD

Organization: University of Missouri Health Care

Authors: Cora L Housley, PharmD, PGY1 Resident University of Missouri Health Care; Jacob Kettle, PharmD, BCOP, Clinical Pharmacy Specialist, University of Missouri Health Care.

Category: Original

Title: Establishment and effects of appropriate opioid use guidelines in the emergency department

Purpose: The national opioid epidemic has placed much emphasis on reducing opioid utilization. Christian Hospital currently has the busiest emergency department in the Saint Louis, Missouri area, but does not have opioid guidelines in place. The objectives of this study are to establish Appropriate Opioid Use (AOU) guidelines and to determine if implementation of the guidelines improves appropriate opioid prescribing in the emergency department.

Methods: The electronic medical record will identify all patients who visited the emergency department from February 23 - April 7, 2016 (pre-guideline implementation group) and from February 22 - April 7, 2017 (post-guideline implementation group). All patients receiving analgesics in the emergency department and/or upon discharge who meet the inclusion and exclusion criteria will be included in the data collection and analysis of the study. The primary endpoints include the percentage of patients receiving opioid and non-opioid analgesics during their emergency department visit and the percentage of opioid and non-opioid prescriptions upon discharge. The secondary endpoints include the total cumulative dose of opioids in morphine milligram equivalents (MME) per emergency department visit, the total daily dose of opioids in MME prescribed at discharge from the emergency department, and the percentage of each administrative route of opioid in the emergency department.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Kaitlin Krisik, PharmD

Organization: Christian Hospital

Authors: Kaitlin Christine Krisik, PharmD: Saint Louis College of Pharmacy, Saint Louis, MO; PGY-1 Pharmacy Practice Resident, Christian Hospital, Saint Louis, MO; Leah Ogle, PharmD: University of Tennessee Health Science Center, Memphis, Tennessee; PGY-1 Residency: Department of Veteran Affairs, Tennessee Valley Healthcare System, Nashville, Tennessee; PGY-2 Residency, Internal Medicine: Kinsbrook Jewish Medical Center, Brooklyn, New York; BCPS, Clinical Pharmacist, Christian Hospital, Saint Louis, MO; Saint Louis College of Pharmacy, Saint Louis, MO; Karen Scott, RPh: Saint Louis College of Pharmacy, Saint Louis, MO; MBA, Pharmacy Manager, Christian Hospital, Saint Louis, MO.

Category: Original

Title: Evaluation of Pharmacy's Impact on Medication Errors Resulting from Home Medication Documentation

Purpose: The purpose of this study is to determine if documentation of the patient's home medication list by pharmacy staff provides a more complete and accurate list than home medication lists documented by non-pharmacy staff upon inpatient admission.

Methods: This was a retrospective, single-center study conducted from November 2016 – February 2017. Patients were included if, while inpatient, a patient care pharmacist reviewed their home medication list. A total of 200 patients were included for analysis. Of the 200 patients, 50 patients were included from each of the four nursing divisions with patient care pharmacist coverage. The first 25 patients with pharmacy staff completed home medication lists and the first 25 patients with non-pharmacy staff completed home medication lists were included for the total of 50 patients per nursing division. The patient care pharmacist documented patients with discrepancies on their home medication list and patients with no discrepancies on their home medication list. A separate pharmacist was assigned to collect individual patient data and analyze home medication discrepancy data to determine if home medication lists documented by pharmacy staff had fewer errors than home medication lists documented by non-pharmacy staff.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Sarah Lindauer, PharmD

Organization: St. Luke's Hospital

Authors: Mary E. Curtright, PharmD, St. Luke's Hospital; Catherine A. Goetz, RPh, St. Luke's Hospital; Kathryn L. Krei, PharmD, St. Luke's Hospital.

Category: Original

Title: Evaluation of peripheral opioid antagonists prescribed for opioid induced constipation

Purpose: Methylnaltrexone is a competitive peripheral mu-opioid receptor antagonist that is indicated for the treatment of opioid induced constipation (OIC). In trials that have shown efficacy of methylnaltrexone for OIC, patients received treatment based on explicit criteria and were managed in a systematic fashion. The goal of this analysis was to evaluate appropriate use of methylnaltrexone at University of Missouri Health Care (MUHC).

Methods: Patients were included in the analysis if they were >18 years of age and had an order for methylnaltrexone between July 1, 2015 to June 30, 2016. Patients were excluded if methylnaltrexone was not administered or if the patient had an acute surgical abdomen or postoperative ileus. Criteria for appropriate use included: correct dose, use of >2 prior laxatives, current morphine equivalent of >50 mg per day, and chronic opioid therapy for >2 weeks for advanced illness patients or >4 weeks for non-cancer patients. Results: A total of 156 patients were included for analysis. Use of methylnaltrexone was inappropriate in 141 (90.4%) patients. Methylnaltrexone use was most commonly inappropriate due to criteria of duration of chronic opioid use in 123 (78.8%) patients or chronic opioid therapy with <50 mg morphine equivalent per day in 114 (73.1%) patients. Conclusions: At MUHC, there is a high rate of inappropriate use of methylnaltrexone. A follow up analysis of appropriate use of peripheral opioid antagonists will be completed after implementation of criteria for use.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Megan Nicklaus, PharmD

Organization: University of Missouri Health Care

Authors: Megan Nicklaus, PharmD, BCPS; Ryan Camden, PharmD, BCPS; University of Missouri Health Care, Columbia MO.

Category: Original

Title: Utilizing Existing Staff to Address Antimicrobial Stewardship Needs in a Small Urban Community Hospital

Purpose: Antimicrobial stewardship is a necessary responsibility in healthcare facilities to control the emergence of bacterial resistance, health care costs, and healthcare-acquired infection rates. The Joint Commission adopted a new Medication Management standard (MM.09.01.01) to define required elements of Antimicrobial Stewardship Programs (ASPs), effective 1/1/17. In preparation, the study site's Pharmacy Department sought to develop an ASP pilot with existing pharmacy staff. The purpose was to determine if an internal change made to the staffing model, allowing a lead pharmacist dedicated time to perform ASP activities, was effective in reducing the duration of broad-spectrum antibiotics and overall anti-infective use.

Methods: The pilot was conducted at a small community hospital with an average daily census of 69 patients comprised of 40% behavioral health patients from 6/13/16 to 12/13/16 compared to a pre-intervention period of 1/1/15 to 12/31/15. Before pilot initiation, the feasibility of dedicating an entire shift to ASP efforts was determined by evaluating the average number of orders processed on weekdays versus weekends. A weekend shift was moved to Monday to assign an existing staff member as the designated lead ASP pharmacist for the department. ASP presentations, readings, and competency questions provided further training for pharmacy staff. The lead ASP pharmacist reviewed antimicrobial drug therapy based on daily trigger reports and monitored for clinical response. Interventions focused on drug-bug mismatch, de-escalation, discontinuation, and duration of therapy opportunities. The pharmacy staff was encouraged to make antimicrobial stewardship interventions throughout the week. The number of pharmacist-driven ASP interventions and duration of therapy for the most impacted broad-spectrum antibiotics were the primary outcomes. Cost per adjusted patient days for anti-infectives was the secondary outcome.

Results: Research in Progress. There was a 6-fold increase in the number of antimicrobial stewardship interventions with 310 interventions in the 6-month post-intervention period as compared to 51 interventions in the 12-month pre-intervention period. The two most impacted antibiotics by this pilot were levofloxacin (90 interventions) and piperacillin-tazobactam (38 interventions). The average durations of therapy decreased by 4% and 1% for levofloxacin and piperacillin-tazobactam respectively in the post-intervention versus the pre-intervention periods. Average anti-infective cost per adjusted patient day decreased from \$4.94 to \$3.10 in the pre-intervention versus the post-intervention period. (Additional data to be presented at the meeting.)

Conclusions: Research in Progress. In hospital settings across the United States, ASPs are being created to optimize the use of antibiotics, prevent resistance and minimize adverse events. As shown in the pilot, for smaller community hospitals, creating internal infrastructure to support ASP efforts can still make an impact. (Additional data to be presented at the meeting.)

Submitting Author: Zeina Samara, PharmD

Organization: Westlake Hospital

Authors: Zeina E. Samara, PharmD, Clinical Pharmacist Tenet Healthcare - Westlake Hospital; Dan V. Ciarrachi, RPh, Clinical Pharmacist Tenet Healthcare - Westlake Hospital; Charlene Hope Henry, PharmD, MS, BCPS, Quality and Safety Pharmacy Manager, Chicago Market, Tenet Healthcare - MacNeal, Weiss, West Suburban, Westlake; Stacy Thomas Scaria, PharmD, Clinical Pharmacist Tenet Healthcare – West Lake Hospital; Deanna McMahon Horner, PharmD, BCPS, Clinical Pharmacy Manager, UnitedHealthcare Medicare & Retirement, Part D STARs.

Category: Original

Title: The Optimization of Automated Dispensing Cabinets in an Academic Medical Center

Purpose: Pharmacy leaders in the medical center were challenged with improving efficiency within the department operations and utilizing current technology and automation in the most efficient manner to meet the patient care needs.

Methods: The University of Chicago Medical Center has contemporary pharmacy automation solutions in place, some of which include automated dispensing cabinets (ADCs). An attempt to maximize the efficiency of the drug distribution technology was made, focusing in on the medication dispensing carousels located within the pharmacy and the automated dispensing cabinets located in the patient care areas throughout the medical center. The primary objective of the optimization efforts were to maximize the amount of medications dispensed from the machines and to reduce the burden and repetition involved in restocking the machines on a routine basis by pharmacy technicians. The established reporting capabilities of the ADC database allowed the pharmacy managers to create and summarize removal reports, patient specific bin reports, and refill activity reports over a 6 month period prior to any changes being made. Pharmacy automation analysts were then able to evaluate these specific reports to map out a gap analysis showing which ADCs possessed medications not being utilized effectively and which ADCs were missing medications as common stock items that were being routinely added and dispensed as a patient specific medication. Par levels for each drug added to the ADCs were adjusted as space allowed to account for package sizes stored centrally in pharmacy and to require an ADC restock no more than twice weekly versus multiple times a week in the previous state. A standard operating procedure was also drafted to outline the steps of this review process and to ensure the routine evaluation of the ADCs on a periodic basis for continued improvement and maintenance.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Anthony Scott, PharmD

Organization: The University of Chicago Medicine

Authors: Kevin Colgan, MA, FASHP, Vice President, Chief Pharmacy Officer, The University of Chicago Medicine; Anthony C. Scott, PharmD, Assistant Director of Pharmacy Operations, The University of Chicago Medicine; Monika K. Lach, PharmD, PGY-1/PGY-2 Health-System Pharmacy Administration Resident, The University of Chicago Medicine; Bernice Y. Man, PharmD, PGY-2 Health-System Pharmacy Administration Resident, The University of Chicago Medicine.

Category: Original

Title: Medication utilization and patient falls correlated with the use of melatonin and zolpidem in the hospital

Purpose: Patient falls is one of the most common adverse events reported in the inpatient care settings. Among hospitalized patients, rates of falls range from 1.97 to 8.40 falls per 1000 patient-days. Patient falls prolong hospitalization, increase cost of care, and have the potential to cause serious injury. There are multiple risk factors reported in literature that are associated with falls, including: advanced age, muscle weakness, gait or balance problems, visual impairment, dizziness or vertigo, cognitive deficits, and use of psychotropic medications. Zolpidem is among one of the psychotropic medications commonly used in the inpatient setting that has been reported to decrease balance and has been independently associated with falls. Zolpidem use in hospitalized patients may be a potentially modifiable risk factor for falling. At University of Chicago Medicine (UCM), melatonin, an alternative sleep aide was added to the formulary in 2014. This project aims to compare falls that correlated with the use of zolpidem and melatonin as well as to analyze the prescribing pattern of zolpidem and melatonin at UCM since the addition of melatonin to formulary.

Methods: A retrospective analysis was conducted using data collected from patients between July and December of 2014 and July and December of 2015, which were defined as periods pre and post addition of melatonin to formulary respectively. Patients included in the study were greater than 18 years of age who received either zolpidem or melatonin or fell during the study time periods. Patients were identified by either having an adverse event report submitted for a fall and/or if they had an active medication order for either melatonin or zolpidem on pharmacy utilization reports.. Patients were excluded if they fell during an outpatient visit or if the location of the fall could not be determined due to incomplete reporting. The primary objective was to compare the incidence of falls in patients receiving melatonin or zolpidem, or both agents, or neither agent. The secondary objective was to analyze the utilization trends of zolpidem and melatonin at UCM during the study period. The following data will be collected: age, gender, date of patient fall, admitting service, hospital unit, days of sleep aide therapy, dosage and proximity of the last dose to the fall.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Lida Timothy, PharmD, BCPS

Organization: University of Chicago Medical Center

Authors: Lida Timothy, PharmD, BCPS, Clinical Pharmacist, University of Chicago Medical Center; Hailey Soni, PharmD, BCPS, Clinical Pharmacy Specialist - Internal Medicine, University of Chicago Medical Center; Judy Doty, MSN, RN, Nursing Quality Manager, University of Chicago Medical Center; Meghan Conroy Sweis, MSN, RN, Nursing Quality Specialist, University of Chicago Medical Center; Randall Knoebel, PharmD, BCOP, Clinical Manager, University of Chicago Medical Center.

Category: Original

Title: Evaluation of the effect of prior anti-arrhythmic drug use on the success of atrial fibrillation catheter ablation

Purpose: Current guidelines recommend catheter ablation (CA) for atrial fibrillation (AF) refractory to at least one anti-arrhythmic drug (AAD), but do not define an adequate number of AADs to be trialed prior to considering ablation. The primary objective of this study is to evaluate the effect of CA success based on the number of AADs failed in patients with paroxysmal or persistent AF. The secondary objective will be to evaluate the effect of CA success based on the degree of left atrial scarring.

Methods: This is a single-center, retrospective cohort study that will evaluate patients at a 450-bed community hospital. Patients at least 18 years of age with paroxysmal or persistent AF who underwent an initial CA between June 1, 2015 and December 1, 2016 will be screened for enrollment. Patients with unknown AAD histories, who did not achieve acute procedural success, or who were lost to follow-up or death unrelated to thromboembolic stroke within six months post-ablation will be excluded. CA success will be assessed by freedom from AF after ablation. The primary outcome is the presence or absence of AF or flutter captured on an electrocardiogram or other recording device at 3, 6, 9, and 12 months after the procedure.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Michelle Wang, PharmD

Organization: Missouri Baptist Medical Center

Authors: Michelle X. Wang, Pharm.D - Missouri Baptist Medical Center; Katie B. Tellow, Pharm.D, BCPS - St. Louis College of Pharmacy; Anastasia L. Armbruster, Pharm.D, BCPS - St. Louis College of Pharmacy; Andrew J. Krainik, MD, MPH, FHRS - The Arrhythmia Center at Missouri Baptist Medical Center; Karthik Ramaswamy, MD, FHRS - The Arrhythmia Center at Missouri Baptist Medical Center.

Category: Encore

Title: Evaluation of sustained virologic response rates after hepatitis C virus treatment among a diverse patient population at an urban academic medical center

Purpose: Research Question or Hypothesis: Are real-world SVR rates among diverse patients treated with various HCV regimens at an urban academic medical center comparable to those of clinical trials?

Methods: Data were collected from electronic medical records of patients who started HCV treatment from January 1, 2014 to February 3, 2016, and analyzed using descriptive statistics, Fisher's exact test, and Pearson's chi-square test. The primary endpoint was percent who achieved SVR in each treatment group.

Results: Four hundred ninety-nine patients started treatment; data were not available for 41 who had not yet reached 12 weeks after treatment completion at data collection, or 87 who were missing labs, lost to follow-up, or had transferred care. The remaining 371 patients were 64% male, 55% black, had a mean age of 59 years, and mean BMI of 29. Eighty-nine percent had genotype (GT) 1, 33% were treatment-experienced, 50% were cirrhotic, 17% were post-transplant, 29% had diabetes, and 25% had baseline psychiatric disease. Overall, treatment-naïve, and treatment-experienced GT1 SVR rates were 65%, 63% and 67% with sofosbuvir and ribavirin; 87%, 93% and 77% with simeprevir and sofosbuvir; and 93%, 94% and 91% with ledipasvir/sofosbuvir; and 93%, 88% and 95% with ledipasvir/sofosbuvir and ribavirin. Overall SVR rates for GT2 and GT3 were 72% and 69% with sofosbuvir and ribavirin.

Conclusions: Treatment groups had comparable or numerically lower SVR rates than those reported in clinical trials. The patient population included a high percentage of difficult-to-treat cirrhotic, treatment-experienced, and post-transplant patients. Most patients were black babyboomers; many had diabetes and psychiatric disease.

Submitting Author: Grace Go, PharmD Candidate

Organization: University of Illinois Hospital and Health Science System and College of Pharmacy

Authors: Dr. Michelle Martin, PharmD, BCPS, BCACP1; Darby Rosenfeld, PharmD Candidate; Lauren Vitrano, PharmD Candidate; Grace Go, PharmD Candidate; Victoria Ramos, PharmD Candidate; Myrna Rivas, PharmD Candidate; Todd Lee, PharmD, Ph.D. - Department of Pharmacy Practice, University of Illinois Hospital and Health Sciences System / University of Illinois at Chicago College of Pharmacy, Chicago, IL; University of Illinois at Chicago College of Pharmacy, Chicago, IL

Category: Student

Title: The Use of Oral Metolazone Versus Intravenous Chlorothiazide as an Adjunct to Loop Diuretics in Acute Decompensated Heart Failure with Reduced Ejection Fraction

Purpose: Purpose: Thiazide and thiazide like diuretics, such as intravenous (IV) chlorothiazide and oral (PO) metolazone, are added to IV loop diuretic therapy to achieve adequate diuresis in patients experiencing acute decompensated heart failure (ADHF). A recent comparison of IV chlorothiazide and oral metolazone showed no efficacy difference via net urine output (UOP), however, a large difference in cost exists. This previous evaluation utilized net urine output, included patients with reduced and preserved ejection fraction (EF), excluded patients with creatinine clearance of 15-50 ml/min, and did not comment on patients receiving dialysis or ability to receive oral medications. The aims of this study are to assess the appropriateness of use, to analyze the effect on cost, and total UOP of PO metolazone versus IV chlorothiazide as an adjunct to IV loop diuretics in ADHF patients with reduced ejection fraction (EF).

Methods: This single-centered, retrospective, non-inferiority chart review received approval from the Barnes-Jewish Hospital and Saint Louis College of Pharmacy Institutional Review Boards. The study period was from August 1st, 2011 to August 15th, 2016. The study was divided into drug use evaluation (DUE) and clinical outcomes evaluation. All inpatients with a primary diagnosis of ADHF who received at least one dose of PO metolazone or IV chlorothiazide were included in the DUE. Of these patients, the clinical outcomes only included adults with EF < 40% receiving IV loop diuretics and other PO or per tube medications. Patients receiving dialysis or ultrafiltration were also excluded from the clinical outcomes evaluation. The DUE primary outcomes assessed the appropriateness of utilization, utilization patterns, and cost difference per course of therapy. The clinical outcomes evaluation assessed the change in 24 hour total UOP after the addition of PO metolazone or IV chlorothiazide to IV loop diuretics. Secondary clinical outcomes included length of stay, net UOP post thiazide addition, total UOP per thiazide course of therapy, adverse effects, and mortality. Descriptive statistics were applied for the DUE and inferential statistics were used to compare clinical outcomes.

Results: Patients received either metolazone and/or chlorothiazide during a total of 626 hospitalizations, 249 received only PO metolazone, 213 received only IV chlorothiazide, 158 received both PO metolazone and IV chlorothiazide, and 6 received only PO chlorothiazide. Of those receiving both PO metolazone and IV chlorothiazide, 62 received metolazone first and 96 received chlorothiazide first. Regarding patients receiving IV chlorothiazide, 21 of the 96 (22%) receiving IV chlorothiazide prior to metolazone and 155 of the 213 (73%) receiving only IV chlorothiazide were mechanically ventilated and unable to take PO medications. Patients receiving either metolazone or chlorothiazide received the first dose at a median of 3 days after admission, for a median duration of 3 days, and received a median of 3 doses per course. The most common doses were chlorothiazide 500 mg and metolazone 5 mg. A total of 2513 doses of IV chlorothiazide were administered with a cost of \$619208.40 based on Average Wholesale Price (AWP), averaging \$1660.08 per hospital course. A total of 2183 doses of PO metolazone were administered with a cost of \$5048.21 based on AWP, averaging \$12.46 per hospital course. The cost difference in cost between IV chlorothiazide and oral metolazone was 122 times the cost of oral metolazone. Results regarding difference in urine output are currently in progress.

Conclusions: The large difference in cost present between PO metolazone and IV chlorothiazide poses a large burden to health-systems caring for patients with ADHF. Given that 133 patients in our sample were able to take oral medications, this is an area for potential pharmacy interventions, pharmacy directed protocols, or use-criteria to be developed.

Submitting Author: Brian Bohn, PharmD Candidate

Organization: St. Louis College of Pharmacy

Authors: Brian Bohn, PharmD Candidate, St. Louis College of Pharmacy; Rim Mekonnen Hadgu, PharmD Candidate, St. Louis College of Pharmacy; Jerrica Shuster, PharmD, BCPS (AQ-CV), Barnes-Jewish Hospital; Hannah Pope, PharmD, BCPS, Barnes-Jewish Hospital.

Category: Student

Title: Evaluation of post-percutaneous coronary intervention education at an urban safety-net hospital

Purpose: Purpose: Coronary artery disease is a condition that affects approximately 15.5 million people in the United States and accounts for nearly 1.4 million hospital admissions annually. In 2010, 954,000 inpatient percutaneous coronary intervention (PCI) procedures were performed. Following the procedure, patients require targeted intervention to reduce risk of recurrent events, readmission, and cardiovascular death. The purpose of this study was to retrospectively determine the characteristics of the patients undergoing PCI at an urban safety-net hospital. A secondary objective was to explore the impact of post-PCI education and post-discharge follow-up phone calls on 30-day readmission rates and emergency department (ED) visits.

Methods: The institutional review board approved this retrospective cohort study evaluating a post-PCI pharmacy driven education program at an urban safety-net hospital. Education was verbally provided to patients in person prior to discharge by student pharmacists trained to utilize standardized printed education materials that patients kept following the session. Points emphasized during education included indications of each cardiovascular medication, side effects, disease state management pearls, and the importance of adherence to prescribed medications. Study participants consisted of inpatients with coronary artery disease discharged between January 1st and December 31st 2015 who underwent a PCI procedure while hospitalized. The following data points were collected on a standardized form utilizing the electronic medical record system: patient demographics, length of stay, indication for PCI, discharge medication regimen, patient education specifics, and follow-up considerations.

Results: During the study period, 225 PCI procedures were performed on 223 patients averaging 56.9 years of age, 69.3 percent of whom were male. Length of stay averaged 2.86 days. Indication for PCI was elective in 31.1 percent of patients, 21.8 percent were ST-segment elevation myocardial infarctions, and 47.1 percent were non-ST-segment myocardial infarctions. Education was completed with 71.6 percent (n equals 161) of patients and a post-discharge follow-up phone call was completed with 76.9 percent of patients (n equals 173). The time spent educating each patient averaged 16.26 minutes. The average time to follow-up phone call was 91.65 hours post-discharge. Thirteen percent of patients were readmitted within 30 days after discharge (n equals 30); however, 3.1 percent (n equals 7) of these patients were readmitted for a planned procedure. Nineteen percent (n equals 43) of patients returned to the ED within 30 days post-discharge. There were less 30-day readmissions in the group that received inpatient education compared to the group that did not (11.2 percent versus 18.8 percent, respectively) as well as those who received a follow-up phone call (12.1 percent versus 17.3 percent, respectively); however, these differences were not statistically significant (p equals 0.132 and p equals 0.336, respectively).

Conclusions: In an urban safety-net hospital setting, student pharmacists provided education regarding cardiovascular medications to 71.6 percent of inpatients who underwent a PCI procedure in 2015. The secondary measures showed favorable results with 7.6 percent fewer patients who received inpatient education readmitted within 30 days after discharge and 5.2 percent fewer readmissions within the group that received a post-discharge follow-up phone call; however, these results were not found to be statistically significant.

Submitting Author: Megan Chittum, PharmD Candidate

Organization: UMKC School of Pharmacy

Authors: Megan Chittum, PharmD Candidate, Kristin Peterson, PharmD Candidate, Nathan Donovan, PharmD Candidate, - UMKC School of Pharmacy; Andrew Smith, PharmD, BCPS, AQ Cardiology - Truman Medical Center.

Category: Student

Title: Evaluation of Nesiritide use as adjunctive therapy in decompensated heart failure with reduced ejection fraction

Purpose: Nesiritide is a recombinant B-type natriuretic peptide (BNP) that leads to vasodilation or has vasodilatory properties. It is FDA approved for relief of dyspnea in patients with acute decompensated heart failure, but has conflicting supporting literature. Previous meta-analyses have shown association between the use of nesiritide and renal toxicity as well as mortality. A large randomized controlled trial, ASCEND-HF, demonstrated that the use of nesiritide was not associated with increased rates of death or worsening renal failure, and there was a nonsignificant effect on dyspnea. Due to the high cost of this agent and questionable efficacy, analysis of drug use, as well as efficacy and safety is justified. The primary objective for this drug use evaluation (DUE) is to describe the prescribing patterns, assess the appropriateness of use, and review the cost per course of nesiritide therapy in patients with acute decompensated heart failure at a large academic teaching hospital. When assessing clinical outcomes, our aim was to determine if there is a difference in the change in 24 hour net urine output (UOP) as well as any changes in hemodynamic readings obtained from a right heart catheter.

Methods: This single center, retrospective chart review was approved by the Barnes-Jewish Hospital Institutional Review Board. Data was reviewed for patients that received nesiritide from September 1, 2015 to September 30, 2016. The study was divided into a DUE and clinical outcome evaluation. All patients that were hospitalized with the primary diagnosis of ADHF that received nesiritide were included. The DUE outcomes assessed the overall utilization patterns and cost per course of therapy. The clinical outcomes assessed the change in 24 hour UOP and changes in right heart catheter readings when available. Secondary objectives were hospital length of stay, mortality, change in weight, and adverse effects such as hypotension and increase in serum creatinine.

Results: The change from baseline to 24 hours after initiation of nesiritide goes as follow: weight (mean, kg)  $-0.73 \pm 4.73$ , 24-hour urine output (mean, mL)  $-242 \pm 2828.2$ , serum creatinine (mean, mg/dL)  $-0.27 \pm 0.78$ , central venous pressure (mean, mmHg) 5.7, and pulmonary arterial pressure (mean, mmHg) 56/30. The change from baseline to 24 hours after discontinuation of nesiritide goes as follows: weight (mean, kg)  $-2.63 \pm 6.11$ , 24-hour urine output (mean, mL)  $-984 \pm 1932.7$ , SCr (mean, mg/dL)  $-0.05 \pm 0.64$ , CVP (mean, mmHg) 6.3, and PAP (mean, mmHg) 53/30.

Conclusions A total of 27 patients received nesiritide for a median of 69 hours (0.5-337 hours) at a starting dose of 0.01 mcg/kg/min (26, 96%). Most patients were in an ICU upon initiation of nesiritide (15, 55.6%). A total of 124 vials were used to prepare nesiritide therapy for these 27 patients. 8 patients (29.6%) had a pulmonary artery catheter in place during administration. Death occurred in 8 patients (29.6%) and the mean length of stay was 30 days.

Conclusions: Overall, the use of nesiritide poses a cost burden to health-systems caring for patients with ADHF. This review demonstrated that the use of nesiritide led to a minimal impact on 24 hour urine output as well as hemodynamic parameters measured from a pulmonary artery catheter in patients with ADHF. The development of use-criteria for administration of nesiritide in a large academic teaching hospital may be warranted.

Submitting Author: Lindsay Dreier, PharmD Candidate

Organization: Barnes Jewish Hospital

Authors: Lindsay Rae Dreier, PharmD Candidate 2017; Hannah Elizabeth Pope, PharmD, BCPS; Jerrica Evelyn Shuster, PharmD, BCPS (AQ-CV).

Category: Student

Title: Assessment of Calcitonin in Hypercalcemia of Malignancy

Purpose: Roughly 20% of all patients with an oncological malignancy will experience hypercalcemia of malignancy (HCM) at some point during their illness. Treatment is multi-modal, with calcitonin being used for severe and neurologically-compromised cases. Even though calcitonin has been shown to acutely decrease calcium levels for over 30 years, the ideal patient predictors of treatment success have not been firmly established in the guidelines. In addition, the cost of calcitonin has significantly increased in the past several years. With this, it is important to characterize Barnes-Jewish Hospital's (BJH) calcitonin utilization to determine if further use guidelines are necessary.

Methods: A retrospective analysis was performed at BJH. Consecutive patients hospitalized from July 1, 2015 to June 30, 2016 with hypercalcemia of malignancy who had received at least 1 dose of subcutaneous or intramuscular calcitonin were included. Patients were excluded if they were <18 years old or had an underlying defined calcium-elevating disease state. At baseline, demographic, laboratory, and medical history data were collected. At time of HCM diagnosis, laboratory, medication use, and healthcare utilization data were collected. Our primary composite outcome of compliance was defined with our institution's current calcitonin dosing criteria and the presence of neurological symptoms: dose  $\leq 400$  units + subcutaneous route + duration  $\leq 48$  hours + number of doses  $\leq 4$  + neurologic involvement. Our secondary outcomes included each of the individual parts of the composite primary outcome, in addition to the time to calcium level normalization, and potential cost avoidance.

Results: 94 patients were evaluated for this study that had a median (IQR) calcium at diagnosis of 13.9 mg/dL (12.8-15.5). Patients excluded were those without malignancy (6), those with calcitonin orders that were not administered (5), nasal calcitonin orders (13), milk-alkali syndrome (1), and lastly, those that were given calcitonin at discharge (3). In the primary composite outcome, 49% of patients met our institution's current calcitonin dosing criteria and had neurological symptoms. Our secondary outcomes showed that >90% of patients met criteria for calcitonin use in the areas of dose, route, number of doses, and duration. A median (IQR) of 53 hours (36-90) was required to normalize calcium levels after the first dose of calcitonin. In our cost avoidance analysis, we were able to determine 229 calcitonin vials were inappropriately used during our study period, which amounted to \$627,504.

Conclusions: Our data allows us to characterize BJH's current practice with respect to the use of calcitonin in patients diagnosed with HCM. It is evident that the majority of patients are being treated according to our institutional dosing criteria for calcitonin, but a substantial amount of calcitonin use for HCM is in patients without neurological symptoms. More stringent prescribing considerations should be considered in order to limit the use of calcitonin to only those with neurological symptoms of HCM to further curtail the costs of this medication.

Submitting Author: Matt McKenzie, PharmD Candidate

Organization: St. Louis College of Pharmacy/Barnes-Jewish Hospital

Authors: Matt G McKenzie, 2017 PharmD Candidate, St. Louis College of Pharmacy; Sara K Butler, PharmD, BCPS, BCOP, Oncology Clinical Pharmacy Specialist, Barnes-Jewish Hospital.

Category: Student

Title: The Deprescribing Conversation Project: Giving Nurses the “Words”

Purpose: With the growth of the older adult population in the United States, healthcare professionals are increasingly involved in end-of-life care across a multitude of practice settings including hospitals, skilled nursing facilities, home care, and hospices. Nurses typically are front line providers for patients nearing the end of life and are often expected to deliver precise communication regarding futile treatments and unnecessary medications to patients and families. These conversations can be challenging for nurses as well as emotional for patients and families, who find it difficult to understand why a medication once perceived as beneficial is now being discontinued. Pharmacists with their unique knowledge of pharmacotherapy including medication time-to-benefit (i.e. for statins and other preventive agents) and medication risk-to-benefit profiles may be able to provide nurses with the “words” for difficult deprescribing conversations. The purpose of this “Deprescribing Conversation Project” is to enhance hospice nurses’ knowledge and comfort with deprescribing conversations by providing a structured dialogue for discussing the benefits and burdens of drug therapy in patients with limited life expectancies.

Methods: Two patient-nurse vignettes were scripted and filmed using student pharmacist actors. Each scenario represents a common deprescribing situation; the first video depicts a conversation about discontinuing cholinesterase inhibitor therapy in a patient with late stage dementia. The second video depicts a conversation regarding inhaler polypharmacy in a patient with advanced pulmonary disease and diminished inspiratory capability. Each video illustrates a rational, patient-centered conversation about medication risk and benefit in the context of the patient's goals and life expectancy. With tactful and empathetic communication, the student pharmacist actor also addresses patient and family concerns as well as misconceptions. Registered hospice nurses in northern Illinois will be recruited to participate in viewing these two videos via email correspondence. Before and after viewing the videos, the study participants will be asked to complete a pre and post-survey to assess their perspective and knowledge of deprescribing and their comfort level with conducting these conversations. Pre-survey results will be compared to post-survey results to assess whether the filmed vignettes improved nurses’ knowledge and comfort with deprescribing conversations.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Patrice Davis, PharmD Candidate

Organization: University of Illinois at Chicago (UIC) College of Pharmacy at Rockford

Authors: Patrice Davis, PharmD Candidate, UIC College of Pharmacy at Rockford; Hans Scheerenberger, PharmD Candidate, UIC College of Pharmacy at Rockford; Laura Meyer-Junco, PharmD, BCPS, CPE, UIC College of Pharmacy at Rockford.

Category: Student

Title: Evaluating levetiracetam dosing for early post-traumatic seizure prophylaxis following traumatic brain injuries

Purpose: The 2007 Brain Trauma Foundation Guidelines for the Management of Severe Traumatic Brain Injury (TBI) recommend seizure prophylaxis with phenytoin. Due to the predictable safety profile, lack of required monitoring, ease of administration, and fewer drug interactions with levetiracetam, there has been a prescribing shift from phenytoin to levetiracetam, despite the lack of guideline recommendation. The 2016 guideline update still recommends the use of phenytoin for early post-traumatic seizure (PTS) prophylaxis and does not support a recommendation for or against the use of levetiracetam over another agent. Due to variable dosing throughout the literature, there is insufficient data to make a definitive recommendation. Typical levetiracetam dosing is 500 to 1500 mg every 12 hours with some studies utilizing a loading dose of 1000 mg for early PTS. In a meta-analysis by Zafar et al., the dose of levetiracetam varied between 500 mg to 3000 mg daily. A prospective, open-label, pharmacokinetic study concluded that neurocritical care patients had faster clearances of levetiracetam and shorter elimination half-lives, compared to healthy adults. Therefore, it is unknown whether levetiracetam dosing affects early or late outcomes. The goal of this drug utilization evaluation is to evaluate levetiracetam dosing patterns for seizure prophylaxis following TBI at a large, academic, tertiary care, Level I Trauma Center.

Methods: A retrospective, medical record review of patients in the Surgical, Burn, and Trauma Intensive Care Unit (SBTICU) between June 30, 2015 to July 1, 2016, who received levetiracetam for seizure prophylaxis after experiencing a TBI will be performed. Patients with TBIs were identified by ICD-9 codes. Patients younger than 18 years old and pregnant patients were excluded. Data collection includes Glasgow Coma Scale (GCS), type of bleed, cause of trauma, seizure history and medications that may alter the seizure threshold, and serum creatinine. Levetiracetam doses, administration times, routes, and frequencies will be evaluated for the first seven days. Dosing appropriateness will be determined by daily renal function or type of dialysis. Descriptive statistics were used for all analyses. The primary objective is to determine the median levetiracetam dose used for early PTS prophylaxis post-TBI. Secondary dosing outcomes include dosing by type of bleed, GCS, weight, and renal function. Efficacy outcomes will examine seizure occurrence and inpatient mortality. Analyses will be performed to determine if past medical history and medications affect seizure outcomes.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Alexandra Bixby, PharmD Candidate

Organization: Barnes-Jewish Hospital

Authors: Alexandra Lynn Bixby, PharmD Candidate, St. Louis College of Pharmacy and Barnes-Jewish Hospital, Student Pharmacist; Lisa Marie Boone, PharmD Candidate, St. Louis College of Pharmacy and Barnes-Jewish Hospital, Student Pharmacist; Emily Jo Owen, PharmD, BCPS, BCCCP, Barnes-Jewish Hospital, Critical Care Clinical Specialist.

Category: Residency

Title: Evaluation of parenteral calcitonin in hypercalcemia treatment at a community hospital

Purpose: Hypercalcemia is a laboratory abnormality that can present with renal, neurological, and cardiac symptoms. Common etiologies of hypercalcemia include malignancy and primary hyperparathyroidism. Aggressive hydration and bisphosphonate therapy are mainstays of hypercalcemia treatment. Calcitonin inhibits osteoclast resorption and can quickly lower serum calcium until the onset of bisphosphonate therapy. Calcitonin use should be reserved for patients experiencing symptomatic hypercalcemia and limited to 48 hours of treatment due to tachyphylaxis. The purpose of this medication use evaluation is to assess parenteral calcitonin use at a community hospital.

Methods: A retrospective, single center chart review was performed at a 266-bed community hospital. Using the electronic medical record, all patients who received at least one dose of parenteral calcitonin between the dates 01/01/13 and 08/01/16 were reviewed. No patients were excluded for any reason in this analysis. Patient demographics collected include age, weight, gender, hypercalcemia symptoms, serum corrected calcium, and creatinine clearance. Data collected pertaining to the use of calcitonin includes indication, dose, duration, prescriber service, and use of other hypercalcemia treatments, such as intravenous hydration and bone modifying agents. The primary end point was the utilization of calcitonin for symptomatic hypercalcemia. Secondary endpoints include dose appropriateness and duration of calcitonin as well as calcitonin use in relation to other hypercalcemia treatment modalities. Descriptive statistics will be applied to analyze primary and secondary endpoints.

Results: Twenty-three hypercalcemia patient cases were reviewed in which 65.2% were due to malignancy, 13% were due to hyperparathyroidism, 13% were due to renal failure, and 8.8% due to exogenous intake. All but 13% of the patients were symptomatic upon admission with the most frequent chief complaint being weakness. Of the twenty-three patients treated with parenteral calcitonin, 26.1% were not administered a bone modifying agent along with their parenteral calcitonin. Of the 73.9% that were prescribed a bone modifying agent, 53% received parenteral calcitonin before the bone modifying agent. The extent of calcitonin use did not exceed 72 hours in any patient with 47.8% of these patients having only 24 hours of therapy. Hospitalists were responsible for the bulk of calcitonin prescribing.

Conclusions: This evaluation demonstrates the correct use of calcitonin in the setting of symptomatic hypercalcemia. Bone modifying agents are responsible for the long term stability of calcium levels and therefore should be considered for every patient. As the onset of action of bone modifying agents is longer than that of calcitonin, they should be started upon admission. The results of this evaluation reveal an opportunity for staff education and protocol development in collaboration with oncology and endocrinology.

Submitting Author: Kari Righter, PharmD

Organization: Southeast Hospital

Authors: Kari Righter PharmD, St. Louis College of Pharmacy, PGY-1 Pharmacy Resident, Southeast Hospital; Karen Woomer, PharmD BCPS, St. Louis College of Pharmacy, Clinical Pharmacist, Southeast Hospital; Donald Moore, PharmD, BCPS, BCOP, Massachusetts College of Pharmacy and Health Sciences, Pharmacist Clinical Coordinator, Carolinas Healthcare System.

Category: Residency

Title: Pharmacist education and post-discharge follow-up: Reducing 30-day readmission rates in post-myocardial infarction patients in a community hospital

Purpose: Hospital readmissions contribute to increased patient morbidity and rising health care costs, and many hospitals are at risk for reduced payments due to excessive numbers of readmissions. The purpose of this study is to measure the impact that pharmacists can have on readmission rates for post-myocardial infarction (MI) patients in a 240 bed acute care, community based hospital through medication reconciliation, inpatient education, and timely follow-up upon discharge.

Methods: This study will be submitted to the Institutional Review Board for approval or exemption. This will be a single-center prospective study in patients admitted to a community hospital for myocardial infarction. The electronic medical record will be used to determine baseline readmission rates, and all patients identified upon admission for or with a new diagnosis of MI (both STEMI and NSTEMI) during a six-month timeframe between November 2016 and March 2017 will be included. A pharmacist will provide education for all discharge medications for post-MI treatment recommended by the American College of Cardiology/American Heart Association, as well as comprehensive medication reconciliation upon admission or prior to discharge. The final component will include telephone follow-up within two weeks of discharge to ensure the patient was able to pick up new medications, determine any issues related to taking the medication, and assess potential adherence issues with the 8-item Morisky Medication Adherence Scale. The primary outcome will be the number of readmissions for cardiovascular disease related co-morbidities in less than 30 days.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Grant Florer, PharmD

Organization: Mercy Hospital Joplin

Authors: Rita Stiles, RN, ACNS-BC, CCRC, STEMI - Stroke Program Coordinator, Mercy Hospital Joplin; Amelia Honey, PharmD, BCPS, Pharmacy Clinical Manager, Mercy Hospital Joplin.

Category: Residency

Title: Evaluation of initial dosing of unfractionated heparin in obese patients with venous thromboembolism

Purpose: A 240 licensed-bed acute care hospital uses weight-based protocols to dose heparin in the treatment of active deep vein thrombosis and pulmonary embolism. These protocols utilize maximum bolus dosing and infusion rates that may provide suboptimal time to therapeutic anticoagulation in obese patients. The purpose of this study is to evaluate if using these current dosing protocols in obese patients delays achieving therapeutic levels of anticoagulation compared to nonobese patients.

Methods: This study will be submitted to the Institutional Review Board for approval or exemption. The electronic medical record system will identify patients who had received heparin per the institutional treatment protocols. The following data will be collected: patient age, gender, anticoagulation therapy prior to admission, height and weight on admission, heparin bolus dose and infusion rates, and antifactor Xa heparin assay (anti-Xa HA) levels. Patients will be divided into a nonobese population and an obese population. A time-to-event analysis for achievement of therapeutic anti-Xa range will be assessed. Appropriate statistical analysis will be conducted. All data will be recorded without patient identifiers and maintained confidentially.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Brady Lewis, PharmD

Organization: Mercy Hospital Joplin

Authors: Brady Webb Lewis, PharmD, Pharmacy Resident, Mercy Hospital Joplin; Amelia Rea Honey, PharmD, BCPS, Residency Program Director, Mercy Hospital Joplin; Sarah Ann Boyd, PharmD, BCPS, Pharmacy Director, Mercy Hospital Joplin.

Category: Residency

Title: Oral Vancomycin for Primary Clostridium Difficile Infection Prophylaxis in Patients Receiving High-Risk Antibiotics

Purpose: Clostridium difficile infection (CDI) occurred in over 500,000 patients in 2011, and accounted for 14,000 deaths in the United States in 2007. A variety of risk factors for CDI development have been identified, including antibiotic use, number and duration of antibiotics, duration of hospitalization, age greater than 65 years, gastrointestinal (GI) acid suppression, GI surgery and tube feeds, and immunosuppression. The largest contributor to CDI risk is the use of antibiotics. Hospitals throughout the country have adopted preventative strategies recommended by the Infectious Diseases Society of America (IDSA) and Society for Healthcare Epidemiology of America (SHEA) guidelines, and yet CDI incidence continues to increase. As a result, further preventative measures need to be explored to prevent the first episode of CDI. Currently, there is no literature regarding the use of oral vancomycin for primary CDI prophylaxis in “high risk patients”.

Methods: This is a pre-post intervention, prospective cohort study of patients treated by an ID physician who are determined to be at “high risk” for CDI development. Patients at “high risk” must be 65 years of age or older, on GI acid suppression with a histamine-2 receptor antagonist or proton pump inhibitor, and receiving pre-specified antibiotics for greater than 24 hours. Pre-specified antibiotics include: clindamycin, fluoroquinolones, third and fourth generation cephalosporins, piperacillin/tazobactam, ampicillin/sulbactam, and carbapenems. The intervention is prophylaxis with vancomycin 125 mg by mouth daily, continued until de-escalation of antibiotics or hospital discharge. The primary outcome of this study is CDI occurrence 4 weeks following the completion of antibiotic therapy or hospital discharge, whichever occurs first. Secondary outcomes include time to CDI occurrence and CDI severity. Patients receiving the intervention will be included in the post-intervention arm (study months?). The pre-intervention arm are patients meeting the “high risk” criteria who are not treated with prophylaxis during the same months of the intervention, just one year prior, January 2016 through March 2016.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Ryan Medas, PharmD

Organization: St. Luke's Hospital

Authors: Ryan Edward Medas, PharmD, PGY2 Internal Medicine Pharmacy Resident, St. Luke's Hospital; Jamie Sanders, PharmD, BCPS, Infectious Disease Clinical Specialist, St. Luke's Hospital.

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Category: Original

Title: Evaluation of an adult inpatient sotalol initiation order-set within a large health-system

Purpose: Package inserts (PIs) for sotalol products recommend initiating sotalol under heart rhythm monitoring, starting at a dose of 80 mg once or twice daily (depending on renal function), and waiting at least three days between dose escalations. Our health-system created a standardized sotalol initiation order-set. It includes options for more rapid dose up-titration or higher initial dosing, as well as a procedure for electrocardiographic monitoring. To our knowledge, no studies have evaluated inpatient sotalol dosing protocols that differ from the recommendations of the PIs. The purpose of this project is to evaluate inpatient sotalol initiation within the health-system after the implementation of the order-set.

Methods: Data will be gathered through retrospective review of inpatient medical records for patients who were started on sotalol therapy in the health-system after the implementation of the Sotalol Initiation Order-set. The data collection period will be from January 2016 to March 2017. Inpatient records will be limited to those who were started on sotalol using the order-set. Inpatient records for those who were on sotalol prior to admission will be excluded. The primary objective is to evaluate the length of stay for inpatients initiated on sotalol. Secondary outcomes will include therapy discontinuation during protocol, adverse reactions (Torsade de Pointes, QTc prolongation, new ventricular tachycardia, bradycardia, hypotension) and protocol compliance. Data collection forms will not contain Protected Health Information and will be kept confidentially. IRB exemption has been obtained for this project.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Stacy K. Cassat, MS, PharmD

Organization: Saint Luke's Hospital of Kansas City

Authors: Stacy K. Cassat, MS, PharmD – University of Kansas, PGY1 Pharmacy Resident, Saint Luke's Hospital of Kansas City; Charles Hayes, PharmD – Creighton University, Pharmacist III, Saint Luke's Hospital of Kansas City; Sana Grover, MBBS – Pt. B. D Sharma, Institute of Medical Sciences, Cardiac Arrhythmia Research Fellow, Saint Luke's Hospital of Kansas City; Sanjaya K. Gupta, MD – St. Louis University, Professor of Medicine, Director of Quality for Cardiac Electrophysiology, Saint Luke's Hospital of Kansas City.

Category: Original

Title: Integration of Pharmacy Technicians into Decentralized Pediatric Pharmacy Services.

Purpose: The purpose of this study is to determine whether integration of pharmacy technicians into the decentralized pediatric pharmacy model will improve the medication use process and nursing satisfaction at a community hospital.

Methods: This study has been submitted to the CoxHealth Human Protection Review Board for approval. After a workflow analysis of the pediatric pharmacist team completed in November 2016, a six-week prospective study on a pediatric floor, labor and delivery floor and neonatal intensive care unit will be conducted between December 2016 and January 2017. One decentralized pharmacy technician will be assigned to cover these locations Monday through Friday from 7:00 am to 3:30 pm to improve medication availability through coordination with the pharmacist and communication with nursing staff to address medication procurement needs. Each unit will serve as a control with 6 weeks' analysis during September-October 2016. The number of medication requests routed to the central pharmacy, infant formula mixing delays, medication delivery delays, unit inspection compliance and automated dispensing cabinet stock level adjustments will be evaluated during both study periods. Nursing satisfaction will be surveyed after the intervention period.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Karrie Derenski, PharmD, BCNSP, CNSC

Organization: CoxHealth

Authors: Karrie Derenski, PharmD, BCNSP, CNSC, Clinical Supervisor, Metabolic Support Coordinator, PGY2 Critical Care Residency Director, CoxHealth; Alaina Burch, CPht, Technical Supervisor, Dept of Pharmacy, CoxHealth; Sarah Hall, CPht, Pharmacy Technician, CoxHealth; Josselyn Rostam, CPht, Pharmacy Technician, CoxHealth; Jason Kramer PharmD, BCPS, BCPPS, Pediatric Clinical Pharmacist, CoxHealth; Glenda Adams, RPh, BCPPS, Pediatric Clinical Pharmacist, CoxHealth.

Category: Original

Title: Pharmacist-directed warfarin protocol dosing compared to practitioner warfarin dosing

Purpose: The Joint Commission released National Patient Safety Goal (NPSG) 03.05.01 to reduce the likelihood of patient harm associated with the use of anticoagulant therapy. Multiple studies have shown that pharmacists can play integral role in managing patients' anticoagulation medications such as warfarin. Christian Hospital implemented a new pharmacist-directed warfarin protocol service in February 2016 utilizing pharmacists to meet the NPSG. Previous research was performed comparing pharmacist-dosed warfarin to physician-dosed warfarin at Christian Hospital, but results were inconclusive due to review of only 9 patients at time of analysis. The objective of this study is to assess how successful the pharmacy department is compared to other practitioners at reaching and maintaining therapeutic international normalized ratios (INRs) now that more data is available since time of protocol implementation. This study may show how pharmacists are more successful than other practitioners at managing patients' warfarin effectively in regards to obtaining and maintaining therapeutic INRs. This could lead to fewer bleeding complications, fewer subtherapeutic INRs, and the possibility for physicians and other practitioners to utilize their skills in other areas of need.

Methods: The electronic medical record will identify patients who received warfarin prescribed by physicians and other practitioners from April 1, 2015 to January 31, 2016 as well as patients who have received and will receive warfarin "per pharmacy protocol" from April 1, 2016 to January 31, 2017. Patient charts will be reviewed to track the primary and secondary endpoints. The primary endpoints include days to reach therapeutic INR in new-start warfarin patients and patients out of INR goal range upon admission/pharmacy referral. An additional primary end point will include days within therapeutic INR in new-start patients and patients previously on warfarin. The secondary endpoints include adverse events (thrombus or bleed), supratherapeutic INRs (INR > 5), and percentage of patients who did not receive a therapeutic INR during his or her hospital stay. The following data will be collected: age, sex, ethnicity, first available weight, indication for warfarin therapy, INR on admission through discharge, bridge therapy utilized, prescribing clinician of pharmacy referral, number of days on warfarin, vitamin K doses administered, fresh frozen plasma administered, INR upon discharge, possible interacting medications, discontinuation of dosing service by clinician.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Tiffany Kiehna, PharmD

Organization: Christian Hospital, St. Louis, MO

Authors: No additional information

Category: Original

Title: Utilizing an electronic health record to improve pneumococcal vaccination rates

Purpose: Invasive pneumococcal disease is a serious public health concern that can be prevented with the use of pneumococcal vaccinations. Ensuring patients receive this intervention is complicated by the availability of multiple vaccines, pneumococcal conjugate vaccine (PCV13) and pneumococcal polysaccharide vaccine (PPSV23). Pneumococcal vaccination was removed as a Centers for Medicare and Medicaid Services core measure in 2014, which resulted in many hospitals de-emphasizing this important service. Our hospital's work redesign efforts removed responsibility for screening patients from pharmacy and reassigned it to nursing in 2012. A new inpatient workflow was developed by pharmacy in collaboration with nursing to facilitate the pneumococcal vaccination screening process when the Epic system was deployed in April 2014. In 2015, a retrospective analysis was performed to assess the new system. The correct pneumococcal vaccine was ordered via the screening tool 88% of the time. However, it was also discovered that only 9.9% of ordered vaccines were administered to patients. We saw this as an opportunity to improve this process.

Methods: A retrospective, non-randomized, observational study will be performed. The study period will be from January 1, 2017 through March 31, 2017 and include approximately 2,000 patients. Patients included in this study will be any patients  $\geq 18$  years of age who had an order for either PCV13 or PPSV23. Our previous study which included 1,925 patients will serve as our control group. Data will be collected across our five major metropolitan hospitals throughout the Saint Luke's Health System. Data retrieved will include patient age, location, MAR action (given, not given) status, vaccine billing code, and payer.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Theresa Lockwood, PharmD

Organization: Saint Luke's Hospital

Authors: Theresa Lockwood, PharmD; Jill T. Robke, PharmD, BCPS, FASHP; Mark Woods, PharmD, FASHP, BCPS.

Category: Original

Title: Hyperkalemia management at a large community teaching hospital

Purpose: No consensus guidelines exist to assist practitioners in treating hyperkalemia. Many medications can induce hyperkalemia, including several that have long-term morbidity and mortality benefits. Sodium polystyrene sulfonate (SPS), a cation-exchange resin, is a common treatment option for elevated serum potassium. The inappropriate use of SPS may lead to potassium over correction, electrolyte disturbances, and other potentially serious adverse effects. Pharmacists play a critical role in ensuring the appropriate use of medications, including SPS. The objective of this study is to describe the use of SPS at a large community teaching hospital and evaluate which factors are associated with appropriate use.

Methods: Patients who received at least one dose of SPS are being identified from the electronic medical record and pharmacovigilance software. Data is being collected on approximately 100 patients receiving SPS at Mercy Hospital St. Louis from 12/01/2015 to 12/31/2016. Data including age, sex, race, creatinine clearance (calculated from Cockcroft-Gault equation), potassium, sodium, blood glucose, magnesium, temperature, heart rate, blood pressure, respiratory rate, oxygen saturation, weight, electrocardiogram, height, body mass index, SPS dose, medications that affect potassium, history of heart failure or chronic kidney disease, length of stay, mortality, and hospital unit are being collected and evaluated. Appropriate use is being defined as potassium level greater than or equal to 5.5 mEq/L prior to administering SPS for patients with no contraindications to use, including: hypokalemia (less than 3.5 mEq/L), history of hypersensitivity to polystyrene sulfonate resins, and/or obstructive bowel disease. Descriptive statistics will be used to describe appropriate use, as well as other results. Correlation analyses will be performed to determine if appropriate use is associated with any particular factors.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Zachary Mueller, PharmD

Organization: St. Louis College of Pharmacy / Mercy Hospital St. Louis

Authors: Zachary T. Mueller, PharmD, PGY1 Pharmacy Resident, St. Louis College of Pharmacy / Mercy Hospital, St. Louis; Andrew J. Crannage, PharmD, BCPS, Associate Professor of Pharmacy Practice / Internal Medicine Clinical Pharmacist, St. Louis College of Pharmacy / Mercy Hospital, St. Louis.

Category: Original

Title: Management of Heparin Infusions in the Obese Population

Purpose: In June 2016, an update to the heparin infusion protocol for the treatment of venous thromboembolism was implemented at a 330 bed community hospital. Prior to this update, there were no limitations or caps on the bolus dose or the initial infusion dose of heparin. After the update, patients that weighted >150 kilograms had their bolus and initial infusion dosed based on an adjusted body weight in place of actual body weight. The objective of the study is to review the effects of this change on the patients' initial PTT, time to first therapeutic PTT, and the difference between the initial infusion rate and the infusion rate resulting in 2 consecutive therapeutic PTTs. A secondary objective was to review the effectiveness of the hospital's heparin protocol for all patients >100 kilograms.

Methods: This is a retrospective quality improvement project. Patients admitted after June 14th 2016 who were prescribed heparin from the "heparin for VTE" order set were eligible for inclusion. Other inclusion criteria included a weight > 100 kilograms, documentation of an administered heparin bolus and initial infusion, and at least one PTT result obtained after the initiation of the infusion. Measurement of PTTs and changes to the heparin infusion rate were reviewed for compliance with the hospital's protocol. The primary outcome is time to first therapeutic PTT. Data collection included weight, body mass index, bolus dose, initial infusion rate, baseline and the first three subsequent PTTs, time to first therapeutic PTT, infusion rate at the time of two consecutive PTTs, and major and minor bleeding episodes.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Kathryn Wdowiarz, PharmD, BCPS

Organization: Midwestern University and Edward Elmhurst Healthcare

Authors: Kathryn Wdowiarz, PharmD, BCPS, Assistant Professor, Midwestern University Chicago College of Pharmacy, Downers Grove, IL, and Internal Medicine Clinical Pharmacist, Edward Elmhurst Healthcare, Naperville, I; Danielle Petric, PharmD Candidate, Midwestern University Chicago College of Pharmacy, Downers Grove, IL.

Category: Student

Title: Evaluation of a post-discharge prescription special authorization subsidy at an urban safety net hospital

Purpose: Patients within Truman Medical Centers (TMC) often lack financial resources to acquire acute-need discharge medications. As a result, patients are at risk to remain hospitalized for the entire duration of medical therapy or to discharge unsafely with little access to necessary medications. In response, TMC began a Walgreens Special Authorization program (Walgreens 1APA) in 2011 to assist patients requiring acute, life-sustaining medications. The program has continued expanding since its initiation. Analyzing patient outcomes data, defining the patient population, and evaluating the medication management processes will give researchers the tools to improve the special authorization subsidy for retail prescriptions and to expand services to additional “at risk” patients within the TMC health-system.

Methods: Researchers received approval from the Institutional Review Board to complete a retrospective cohort study. The study population consists of patients admitted to Truman Medical Center-Hospital Hill who discharged between January 1, 2016 and June 30, 2016, and required assistance obtaining post-discharge prescriptions through the 1APA Program. The following information will be collected: age on discharge, gender, post-discharge medication type, indication for therapy, intravenous to oral conversion prior to discharge, quantity of medication dispensed, estimated hospital days prevented, estimated cost avoidance, and all-cause readmission within 30 days. The primary end point is the 30-day unplanned readmission rates for patients approved for the 1APA program. Secondary endpoints will define the demographics of the patient population approved for the 1APA program.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Paige Melling, PharmD Candidate

Organization: Truman Medical Centers

Authors: Paige Melling, PharmD Candidate 2017, University of Missouri-Kansas City School of Pharmacy, Pharmacy Intern at Truman Medical Centers; Lauren Mishler, PharmD, BCPS, University of Missouri-Kansas City School of Pharmacy, Clinical Lead Pharmacist-Transitional Care at Truman Medical Centers; Michael (Tony) Huke, PharmD, BCPS, University of Missouri-Kansas City School of Pharmacy, Clinical Manager-Medication Use/PGY1 Residency Program Director at Truman Medical Centers.

Category: Encore

Title: Evaluation of an argatroban protocol regarding efficacy, safety, and appropriateness of use.

Purpose: To evaluate the use of an argatroban protocol at five hospitals within the SSM Health St. Louis Network in order to assess its efficacy, safety, and appropriateness of use.

Methods: The electronic medical record system was queried to identify all patients aged 18 or older within the five included hospitals who received argatroban between August 1, 2015 and July 31, 2016. All individuals with an aPTT goal within the protocol defined range were included. The following data was collected from the patients' medical records: medical record number, age, diagnosis for argatroban use, baseline lab values (aPTT, PT, INR, AST, ALT, Albumin, SCr, BMI), dosing nomogram used (standard for BMI less than 30, standard for BMI greater than or equal to 30, critical care/hepatic impairment), initial argatroban dose, time to goal aPTT, whether or not aPTT was supratherapeutic prior to goal, number of dose adjustments to attain goal aPTT, dose at goal, deviations from protocol, and adverse effects related to bleeding and thrombosis. Descriptive statistics were utilized to analyze the data. The primary efficacy endpoints were time to goal aPTT and rate of new or extended thrombosis. The primary safety endpoint was the rate of major bleeding as defined by the International Society on Thrombosis and Haemostasis. Compliance rates with the protocol, including appropriate nomogram selection and average number of deviations from protocol, were also be assessed.

Results: Forty patients were evaluated, all of whom had suspected, confirmed, or previously documented heparin-induced thrombocytopenia (HIT). The mean initial dose was  $1.3 \pm 0.6$  mcg/kg/min. The average time to goal was  $6.6 \pm 5.3$  hours, and patients required an average of  $0 \pm 1$  dose adjustments to reach goal. The mean dose at goal was  $1.3 \pm 0.7$  mcg/kg/min. A total of 17 patients were initiated on standard dosing for BMI < 30 (initial dose: 2 mcg/kg/min), with 14 patients initiated on standard dosing for BMI  $\geq$  30 (initial dose: 1 mcg/kg/min) and 9 patients initiated on hepatic/critical care dosing (initial dose: 0.5 mcg/kg/min). Per the protocol, 9 patients qualified for standard dosing for BMI < 30, 5 qualified for standard dosing for BMI  $\geq$  30, and 26 qualified for hepatic/critical care dosing. Although less than 50% of patients were initiated on the appropriate dosing nomogram per the protocol, 72.5% of patients did not require a dose adjustment to attain goal aPTT. In relation to compliance with aPTT monitoring, 35% of patients had at least 1 aPTT drawn late. Bleeding events occurred in 40% of patients, but most were minor and primarily attributed to causes other than argatroban use. No cases of new or extended thromboses were identified.

Conclusions: Current argatroban use within the SSM Health St. Louis Network is safe and effective despite lack of adherence to the protocol. The current argatroban protocol should be modified so patient selection for dosing nomograms per the protocol, specifically the hepatic/critical care dosing nomogram, results in appropriate dosing for patients.

Submitting Author: Sarah Cook, PharmD

Organization: SSM Health St. Mary's Hospital

Authors: Sarah Cook, PharmD - PGY1 Pharmacy Practice Resident, SSM Health St. Mary's Hospital; Brian Rodden, PharmD, BCPS - Critical Care Clinical Pharmacy Specialist, SSM Health St. Mary's Hospital; Davina Dell-Steinbeck, PharmD, BCPS - Clinical Pharmacy Specialist, Residency Program Director, SSM Health St. Mary's Hospital.

Category: Encore

Title: Time is of the essence; evaluation of treatment courses when vancomycin is dosed every 18 hours

Purpose: The purpose of this study is to examine the patient population that has required a dosing interval of every 18 hours to validate this dosing regimen and see if recommendations can be made for initiating a dosing interval of every 18 hours based on patient characteristics.

Methods: This study has already been submitted to and approved by the internal review board. The electronic medical record system will be used to identify adult patients who have received intravenous vancomycin administered every 18 hours. All adult patients between the ages of 18 and 89 who received a dose of intravenous vancomycin administered every 18 hours between August 1, 2013 and July 31, 2016 will be eligible for inclusion. Patients over the age of 89, those on hemodialysis, those who are pregnant, patients receiving continuous infusion vancomycin therapy, patients whose vancomycin troughs were not monitored, and subsequent visits of patients who were previously on q18 vancomycin dosing will be excluded. For the purposes of assessing primary and secondary outcomes the following patient data will be gathered: disease indication, gender, age, creatinine clearance, weight, race/ethnicity, vancomycin trough levels, number of vancomycin doses received, and milligrams of vancomycin in each dose. All data will be collected without patient identifiers and will remain confidential. Analysis will be conducted using descriptive statistics. The primary outcome will be number of patients subtherapeutic, therapeutic, and suprathreshold after receiving q18 vancomycin dosing based on trough levels. Secondary outcomes will include: number of patients who were mildly (21-25), moderately (26-30), or severely (>30) suprathreshold based on trough levels and toxicity associated with vancomycin use.

Results: 141 patients met the inclusion criteria and 110 were included in the analysis due to the fact that some patients received a higher or lower dose than indicated by the protocol. The evaluation found that patients most likely to benefit from a dosing interval of 18 hours were those with a creatinine clearance between 50 and 72 mL/min. After examining the patients who were not therapeutic when dosed at this interval it was found that the majority of those patients did not fall within this identified range. 66% (n=24) of subtherapeutic patients had creatinine clearance values outside the identified range mentioned above and 75% (n=9) of suprathreshold patients had creatinine clearance values outside of the range. The median age for patients who were therapeutic on this regimen was 70 years with an interquartile range of 63 to 76.

Conclusions: This drug use evaluation demonstrates that the vancomycin dosing protocol currently in use at SSM Health St Mary's Hospital should tentatively be expanded to include additional dosing intervals for patients < 75 years of age. A dosing interval of every 18 hours should be initiated in patients with a creatinine clearance ranging from 50 to 70. Furthermore, this range appears to be particularly effective for patients between the ages of 63 and 75 although age appeared to have a lesser effect than creatinine clearance. However, before officially recommending a change in protocol the next step will be to validate the finding of this study by analyzing patients who were suprathreshold on a dosing interval of every 12 hours with a creatinine clearance in the specified range.

Submitting Author: Daphne Goewey, PharmD

Organization: SSM Health St Mary's Hospital

Authors: Daphne Goewey, PharmD, MBA, PGY1 Pharmacy Resident, SSM Health St Mary's Hospital, St Louis; Davina Dell-Steinbeck, PharmD, BCPS, PGY1 Pharmacy Residency Program Director, SSM Health St Mary's Hospital, St Louis; Krista Harry, PharmD, BCPS, Clinical Pharmacy Specialist, SSM Health St Mary's Hospital, St Louis.

Category: Encore

Title: Pharmacy Desensitization in a Collaborative Practice with Allergy Clinic

Purpose: Purpose: Desensitization is a medical treatment for some types of allergies with the aim to induce or restore tolerance to the allergen by reducing its tendency to induce IgE antibody production. Patients are desensitized through the administration of escalating doses of allergen that gradually decreases the IgE-dominated response. The purpose of this poster is to summarize and describe a model for an ambulatory care pharmacy to prepare, label and provide all desensitization medication needs to the Allergy clinic for patient specific administration.

Methods: Patient is seen at the Medical Center and is diagnosed with a disease state that requires the patient to use a drug they may be allergic to. For example, a patient may have a documented metronidazole allergy, but needs the drug for treatment of their diagnosed condition. The Allergy Clinic doctors become involved in the case and will enter a desensitization prescription for the patient. This prescription is sent to the outpatient pharmacy with a time and date that the order is needed by. The outpatient pharmacy assesses the appropriateness of the order by conducting a detailed clinical review, checking the compatibility and stability of products, as well as dosing calculations. Once all clinical requirements are met, the outpatient pharmacy also ensures the products are available and can be ordered through the pharmacy ordering system. With everything in place, the order is prepared and the Allergy Clinic staff picks up the order to administer to the patient in the clinic.

Results: This full-circle collaboration between an outpatient pharmacy and clinic staff allows for a mechanism of completing desensitization orders and ensuring delivery to the Allergy Clinic for the most effective patient care. It was determined that the outpatient pharmacy was best equipped to provide the desensitization orders to the Allergy Clinic because of the detailed clinical review provided, ability to order required products directly, as well as use of an on-site clean room. The outpatient pharmacy has an agreement with the Allergy clinic to have all orders prepared in time for the clinic staff to pick up and take back to clinic. Overall, a model of an outpatient pharmacy-prepared desensitization order was designed and implemented successfully for an affiliated Allergy Clinic. Specifically, patients that were noted to have a documented allergy were able to successfully undergo treatment for their medical condition without increased risk to their health.

Conclusions: An outpatient pharmacy staffed with pharmacists providing thorough clinical review of all desensitization orders and equipped with a sterile compounding facility is best suited to meet the needs for preparation of desensitization orders. All desensitization orders were prepared in a timely and efficient manner, allowing for patient access to quality care and further contributing to positive outcomes such as decreasing risk of allergic reaction during treatment, avoiding major side effects to medications, and decreasing cost for this sensitive patient population.

Submitting Author: Daniel Haywood, PharmD Candidate

Organization: University of Illinois Hospital & Health Sciences System, EEI Ambulatory Care Pharmacy

Authors: Sami Labib, RPh, Clinical Assistant Professor, Pharmacy Practice Assistant Director, Clinical Instructor. Monazzah Sarwar, PharmD, Clinical Instructor, Clinical Pharmacist; Steven Menachof, PharmD Candidate, EEI Extern; Daniel Haywood, PharmD Candidate, EEI Extern.

Category: Student

Title: Assessment of compliance to the guidelines for the appropriate use of push-dose vasopressors at a large academic medical center

Purpose: Acute hypotension is often observed in the intensive care unit (ICU) and it is crucial this be recognized and managed quickly. Bolus administration of intravenous (IV) vasopressors, or “push-dose vasopressors” (typically phenylephrine and epinephrine) are frequently utilized to temporize blood pressure in the acute setting (short-lived hypotension or bridge to vasopressor infusion). While this practice is common, there is a paucity of data addressing appropriate use of these agents. As such, guidelines for use of push-dose vasopressors were created and implemented for in-patient use at a large academic medical center. Prior assessments of adherence to the guidelines demonstrated high rates of noncompliance. To address noncompliance to the guidelines, revisions were implemented to the guidelines. Thus, the aim of this study is to assess continued compliance to the guidelines.

Methods: This was a retrospective medical record review at large academic medical center. The primary objective was to determine adherence to practice guidelines for phenylephrine and epinephrine syringes. A random 20% sample of phenylephrine and a random 20% sample of epinephrine vends from the automatic dispensing machine were assessed for full compliance to the guidelines from May 31-July 31, 2016. Patients were excluded if there was lack of identifying information and use of syringes in a patient care area that does not utilize the electronic medical record for documentation. Full compliance is met if the phenylephrine or epinephrine vend has an order and documentation of administration in the electronic medical record. If a vend was completed, but there is no documentation of administration, there must be record of the syringe being returned to the automated dispensing machine. A vend is partially compliant if a syringe is removed in anticipation of hypotension, not administered to the patient, but not returned to the automated dispensing machine. A vend is noncompliant if there is no order, documentation of administration or documentation of return to the automated dispensing machine. Secondary objectives include determining adherence to practice guidelines specifically for epinephrine syringes.

Results: One thousand five hundred twenty six vends were screened for inclusion (244 epinephrine vends and 1302 phenylephrine vends). A random sample of 20% of each phenylephrine and epinephrine vends were reviewed for primary analysis (n=266 and 55 respectively). Thirty-one vends were excluded due to missing or invalid visit ID (n=20) and lack of available records (n=11). Thus, 290 total vends were included in the final analysis (phenylephrine n=242, epinephrine n=48). One hundred twenty two vends (42%) were observed as being fully compliant to the guidelines, while 53 vends (18.4%) were partially compliant and 115 (39.6%) were non-compliant.

Conclusions: This evaluation demonstrates a decrease in adherence to the guidelines for appropriate use of push-dose vasopressors.

Submitting Author: Sana’a AlSulami, PharmD Candidate

Organization: St. Louis College of Pharmacy

Authors: Sana’a Jayel AlSulami, PharmD Candidate 2017, St. Louis College of Pharmacy; Gabrielle Gibson, PharmD, BCPS, BCCCP, Barnes-Jewish Hospital, St. Louis.

Category: Student

Title: Reducing Polypharmacy: Deprescribing at an Academic Medical Center

Purpose: Polypharmacy is a growing problem within the healthcare system contributing to an increased risk of adverse drug reactions, potential drug-drug interactions, non-adherence to medications, and associated health care costs. The objective of this study is to reduce polypharmacy through the process of deprescribing. Deprescribing is defined as the process of tapering, stopping, discontinuing, or withdrawing drugs that are deemed inappropriate or no longer necessary. Deprescribing aims to manage polypharmacy and improve patient outcomes; therefore, reducing the risks associated with using multiple medications. Additionally, this study aims to enhance the standard of care by evaluating a patient's home medication list during an inpatient hospitalization with the overall goal of simplifying the patient's drug regimen.

Methods: This project was conducted in conjunction with a deprescribing quality improvement initiative at an academic medical center in Springfield, IL. The quality improvement team identified patients aged 65 years or older, taking at least 8 medications at home who were admitted to the Southern Illinois University (SIU) Internal Medicine Team and were patients at the SIU Internal Medicine Team Clinic. The patient's home medication list was reviewed upon admission to the hospital by a pharmacist or a physician on the quality improvement team and potential unnecessary or inappropriate medications were identified with the intent of deprescribing. Stopping these medications was discussed with the patient and documented within their electronic health record. This study used a retrospective chart review to determine which home medications upon admission were considered inappropriate and eligible to be stopped and which medications were actually stopped. The study also recorded the physician rationale for why a particular medication was deprescribed.

Results: Of the numerous patients screened, 31 were eligible for this study. Of these eligible patients, the average number of medications upon admission and discharge was 16 and 15, respectively. On average, 3 medications were deprescribed per patient, yet 5 or more medications were discontinued in 26% of patients. The medications discontinued varied widely from antihypertensive agents, antiplatelet medications, antibiotics, and proton pump inhibitors amongst several other pharmacologic classes. In 45% of patients, the rationale for discontinuation of at least one medication was noted as unnecessary medication therapy and occasionally, the medication was responsible for the patient's hospitalization.

Conclusions: Polypharmacy is a prominent issue in patients 65 years and older. These patients are on several medications, often unnecessarily. The process of deprescribing has several different challenges, but this initiative demonstrated the positive impact of simplifying a patient's drug profile and it would be beneficial if such research was conducted on a larger scale.

Submitting Author: Morgan Atwood, PharmD Candidate

Organization: Southern Illinois University Edwardsville School of Pharmacy

Authors: N/A

Category: Student

Title: Medication use evaluation of metformin in patients with chronic kidney disease

Purpose: Metformin is a first-line medication for the treatment of diabetes mellitus. In April of 2016, the Food and Drug Administration required changes to metformin labeling, pertaining to use in patients with chronic kidney disease (CKD). This quality improvement initiative evaluated patients at the Harry S. Truman VA (HSTVA) with diabetes and CKD, who were not on metformin. The purpose was to identify patients who may benefit from metformin therapy, after the recent FDA labeling changes.

Methods: The quality improvement project was approved in May 2016 by the HSTVA Pharmacy and Therapeutics Committee. A retrospective evaluation was performed through electronic chart review. Veterans at the HSTVA with an outpatient visit between 10/1/2015 and 2/29/2016, a diagnosis of diabetes, no active VA prescription for metformin, eGFR 45-60 ml/min, and A1c  $\geq$  8% were evaluated. Patient charts were assessed for history of prior use of metformin and reason for discontinuation, if applicable. If metformin was discontinued for adverse gastrointestinal (GI) effects, history of a prior trial of metformin SA was collected.

Results: A total of 453 chart reviews were completed, out of which of 64 Veterans met the inclusion and exclusion criteria. Forty-one Veterans received metformin from the VA in the past. The most common reasons for discontinuation included GI adverse effects (n = 14), renal insufficiency (n=14), and unknown reasons (n=9). Of the 14 Veterans with GI adverse effects, nine had not tried metformin SA. Of the five patients with GI adverse effects who tried metformin SA, three still experienced GI adverse effects. A total of 61 patients are candidates for metformin, using either the immediate-release or SA formulation

Conclusions: A total of 61 Veterans at the HSTVA would benefit from the addition of metformin for the control of diabetes. These Veterans will be evaluated for enrollment in the Patient-Aligned Care Team (PACT) pharmacy clinic for the management of diabetes. Alternatively, a pharmacist will recommend to adding metformin to the patients' primary care provider.

Submitting Author: Miriam Belonwu, PharmD Candidate

Organization: UMKC School of Pharmacy at MU

Authors: Miriam Chikodili Belonwu, PharmD Candidate, UMKC School of Pharmacy at MU; Barbara Jean Kasper, PharmD, BCACP, Assistant Clinical Professor, UMKC School of Pharmacy at MU, Harry S. Truman Memorial Veterans' Hospital.

Category: Student

Title: Aztreonam medication use evaluation

Purpose: Identify and explain the reasons for Mercy Hospital Joplin's high aztreonam use based on days of therapy (DOT) per 1000 patient days.

Methods: The profiles of all 69 patients who received aztreonam therapy from Jul-Oct 2016 at Mercy Hospital Joplin were analyzed via a 17 point medication use evaluation (MUE) questionnaire. This questionnaire included information such as: routine order set use, indication, penicillin (PCN) allergy and description, dose and renal function, pharmacy consult and intervention, double beta-lactam coverage, and length of therapy (LOT)

Results: The top indications included pneumonia (51%), severe sepsis/septic shock (23%), and urinary tract infection (UTI) (12%) with an average LOT of 3.62 days. Only 43% of overall orders were for patients with a life-threatening PCN allergy (including hives). Pharmacy was consulted in about 1/5 cases and made adjustments to dose in about half of their consults. The ordering physician followed Mercy Hospital dosing protocol in all but 3 cases with optimal dosing achieved 81% of the time. Double beta-lactam coverage was present in 23% of orders with Zosyn and aztreonam being the most common combination. When ID was consulted in these cases they promptly de-escalated therapy.

Conclusions: All aspects of therapy were optimal in 1/3 cases during this evaluation period. The main areas to target for improved use are: renal adjustment of dosing, prompt de-escalation of therapy, PCN allergy assessment. The aztreonam dosing protocol may also need to be updated to better reflect current recommendations. Another MUE will be conducted in January in order to assess the impact of this MUE and the education of staff that followed.

Submitting Author: Laken Brock, PharmD Candidate

Organization: Mercy Hospital Joplin

Authors: Laken Brock, PharmD Candidate 2017, Creighton University School of Pharmacy and Health Professions.

Category: Student

Title: Fall Risk Assessments in a Community-based Senior Outreach Program

Purpose: Falls among older adults are a serious public health concern. Each year, one in three Americans 65 years and older falls. Of those falls, 55 percent lead to an unintentional injury or death. Medications are a modifiable risk factor for falls; therefore, screening for high-risk drug therapies plays a key role in mitigating medications' impact on falls risk. Furthermore, nationally recognized resources, tools and evidence-based falls prevention programs, exist to empower older adults to decrease their risk of falls. The aim of this study was to screen community based older adults for fall risk, promote community based Matter of Balance program (MOB), and refer those taking high-risk medications to comprehensive medication review (CMR).

Methods: Older adults were screened for fall risk in September 2016, predominantly, at local senior centers (n=15) and one Senior Fest. Assessments included: CDC STEADI Fall Risk Checklist (high risk: if answered Yes to 4 or more questions, if fallen in the past year, if taking medications for sleep or mood disorders, and/or if experiencing dizziness or fatigue due to medications), Timed Up and Go (TUG) test (high risk: >12 seconds), orthostatic blood pressure, and high risk medication class review. All older adults were encouraged to participate in MOB, and those taking high-risk medications were encouraged to have health care provided CMR. Program evaluation was assessed.

Results: Four hundred thirty nine participants (mean age 72.9, range 47-95) were assessed for fall risk. When permitted, those identified at higher risk of falls via the CDC STEADI tool (244/439, 55.58%) were further assessed. Reasons identified for fall risk included: TUG test (69/244, 28.28%), orthostatic blood pressure (11/244, 4.51%), and high-risk medications (150/244, 61.48%). High-risk medication classes included: CNS active medications- benzodiazepines, antipsychotics, anti-epileptics, antidepressants, sedatives, anti-parkinsons', opioids, muscle relaxants and/or antihistamines (52/244, 21.31%), antihypertensives (126/244, 51.64%), and sulfonylureas (17/244, 6.97%). Older adults with two or more CNS active medications (20/244, 8.2%). Older adults likely to participate in CMR (163/439, 37.13%), MOB (169/439, 38.5%) and/or make changes to their home environment (153/439, 34.85%) as a result of the program were referred.

Conclusions: Fall risk assessments by health care providers in community based older adults accompanied with referral to structured evidence based medication reviews and self-care training programs contributes to overall public health, safety promotion and national fall prevention efforts.

Submitting Author: Yesha Patel, PharmD Candidate

Organization: University of Illinois at Chicago College of Pharmacy

Authors: Yesha Y. Patel, PharmD Candidate 2017, University of Illinois at Chicago College of Pharmacy, Hospital Pharmacy Extern, University of Illinois Hospital and Health Sciences System; Michael J. Koronkowski, PharmD, Clinical Assistant Professor, Department of Pharmacy Practice, University of Illinois at Chicago College of Pharmacy; Adam Bursua, PharmD, Clinical Assistant Professor, Department of Pharmacy Practice, University of Illinois at Chicago College of Pharmacy; Kristen L. Goliak, PharmD, Clinical Associate Professor, Department of Pharmacy Practice, University of Illinois at Chicago College of Pharmacy.

Category: Student

Title: Evaluation of Combination Antibiotic Therapy in the Treatment of Pseudomonas aeruginosa in a Community Hospital

Purpose: Empiric antimicrobial treatment for patients at risk for multidrug resistant gram negative organisms such as Pseudomonas aeruginosa has typically consisted of an anti-pseudomonal beta-lactam plus either fluoroquinolone or aminoglycoside.<sup>1,2</sup> At North Kansas City Hospital (NKCH) fluoroquinolones have been predominantly chosen over aminoglycosides due to a more favorable adverse effect profile. As susceptibility rates for fluoroquinolones against Pseudomonas aeruginosa have declined at NKCH, the benefit of empiric double coverage in this patient population has come into question.<sup>3,4</sup> The purpose of this study is to evaluate the appropriateness of routine double coverage empiric therapy for Pseudomonas aeruginosa infections in patients admitted to NKCH.

Methods: This retrospective review included patients admitted to North Kansas City Hospital from August 1, 2014 to July 31, 2016 with blood and/or respiratory cultures positive for Pseudomonas aeruginosa. The primary outcome is the minimum inhibitory concentration of cefepime, levofloxacin, meropenem and piperacillin/tazobactam to Pseudomonas aeruginosa. This data will be incorporated into our recommendations for further empiric coverage of MDR gram negative infections at NKCH.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Megan Chittum, PharmD Candidate

Organization: North Kansas City Hospital

Authors: Kristin Peterson, PharmD Candidate; Megan Chittum, PharmD Candidate; Michael Kallenberger, PharmD, BCPS; Monika Totoraitis, PharmD, BCOP. All North Kansas City Hospital.

Category: Student

Title: Dose Adjustments of Thiopurines in Patients Based on Thiopurine Methyltransferase Activity

Purpose: Azathioprine is a prodrug whose active metabolite, 6-mercaptopurine (6-MP), is a purine analogue that exerts its immunosuppressive effects by interfering with DNA synthesis and repair. 6-MP is metabolized by the enzyme thiopurine methyltransferase (TPMT) to produce 6-methylmercaptopurine (6-MMP). Deficiency of this enzyme leads to excessive amounts of 6-MP, which then causes the metabolism to occur down an alternate pathway. This can result in life-threatening myelosuppression. TPMT is a cytoplasmic transmethylase that is present in most bodily tissues such as the heart, placenta, pancreas, intestine, and red blood cells. When using standard dosing, low levels of TPMT activity have been associated with an increased risk for thiopurine toxicities such as severe myelosuppression. Conversely, high activity levels have been associated with suboptimal treatment. Several studies have examined whether there is a benefit to testing markers of TPMT activity prior to the administration of thiopurines to guide empiric dosing adjustments. Currently, University of Chicago Medicine does not have a protocol that addresses specific starting doses and subsequent dose adjustments of thiopurines based on TPMT phenotype category. The purpose of this retrospective single center study is to identify optimal dosing for patients based on their TPMT phenotype category.

Methods: A lab report of all TPMT results from 1/1/2015 to 6/30/2016 will be used to identify patients that received phenotype testing. Additional data will be obtained from the electronic medical record, including patient demographics and baseline characteristics [age, sex, race, CrCl, TPMT phenotype category (low, low normal, normal, or high), indication for treatment, specific thiopurine drug utilized, initial thiopurine dose, CBC, AST, ALT, alkaline phosphatase, bilirubin, number of subsequent dose adjustments, and final dose]. The primary endpoint will be the final dose for each TPMT phenotype category. Secondary endpoints are the percentage of patients that received dose adjustments based on TPMT phenotype category, the average number of dose adjustments, and the percentage of patients who experiences toxicities and adverse events. Inclusion Criteria: •All patients at UCM who received TPMT phenotype testing between January 1, 2015 and June 30 2016 Exclusion Criteria: •Patients who received no doses of thiopurine drugs following TPMT testing •Pregnant and lactating women •Patients taking febuxostat, doxorubicin, or allopurinol at the time of thiopurine initiation •Patients with a blood transfusion within 60 days prior to TPMT testing •History of use of alkylating agents: Altrexamine, Bendamustine, Busulfan, Carboplatin, Carmustine, Chlorambucil, Cisplatin, Cyclophosphamide, Estramustine, Ifosfamide, Lomustine, Mechlorethamine, Melphalan, Oxaliplatin, Procarbazine, Streptozocin, Thiotepa, Dacarbazine, Temozolomide •Renal transplant rejections •Renal impairment, defined as CrCl <50 ml/min, or patients on Hemodialysis or Continuous Renal Replacement Therapy Statistical Analysis: •Descriptive Statistics •Multi-variant logistic regression

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Brittany Huff, PharmD Candidate

Organization: University of Chicago Medical Center

Authors: Brittany M Huff, PharmD Candidate, Chicago State University College of Pharmacy, Student Pharmacist; Trevor N. Christ, PharmD, University of Chicago Medical Center, Clinical Pharmacy Specialist-Adult Hematology/Oncology; Shannon M. Rotolo, PharmD, BCPS, University of Chicago Medical Center, Clinical Pharmacy Specialist-General Pediatrics.

Category: Student

Title: The Impact of Pharmacist-Driven Pantoprazole to Famotidine Substitution Protocol on Rates of Hospital-Acquired Clostridium difficile

Purpose: According to the FDA, the risk for Clostridium difficile infection (CDI) is 1.4-2.75 times higher among patients on a proton pump inhibitor (PPI) as compared to H2-receptor antagonists (H2RAs). Data from previous trials extensively document a positive association between the use of PPIs and development of CDIs. This study aims to minimize inpatient PPI use and retrospectively compare rates of CDI in patients on antibiotics and pantoprazole versus patients on antibiotics and famotidine.

Methods: A retrospective chart review will be conducted of patients admitted to Decatur Memorial Hospital between 01/04/2016 – 03/21/2016 on pantoprazole and antibiotics and 01/09/2017 – 03/27/2017 on famotidine and antibiotics. Beginning December 2016, patients meeting inclusion criteria requiring GI prophylaxis would be started on famotidine if not on a PPI at home. Patients on a PPI at home requiring GI prophylaxis in the hospital for gastroesophageal reflux disease (GERD), stress ulcer prophylaxis (SUP), or GI protection for dual antiplatelet therapy (DAPT) and concomitantly on any antibiotic therapy would be switched from the PPI to famotidine while inpatient. Patients with Barrett's esophagus, current or history of GI bleed, Helicobacter pylori infection, or previous gastric surgery will be excluded. From 01/09/2017 – 03/27/2017, patients on antibiotics and famotidine will then be assessed to observe CDI rates after the new protocol was implemented.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Regan Kitchens, PharmD Candidate

Organization: Southern Illinois University Edwardsville School of Pharmacy

Authors: Kristi Stice, PharmD, BCPS - Director of Pharmacy, Decatur Memorial Hospital; Sarah Zukoer, PharmD, BCPS, AQC - Clinical Pharmacist, Decatur Memorial Hospital.

Category: Student

Title: Evaluation of pain medication management in patients admitted to a large academic hospital

Purpose: The purpose of this study is to examine pain medication orders and their administration in patients admitted to a large academic medical center, in order to promote opportunities to enhance patient outcomes. Outcomes being evaluated include pain indication, percentage of patients without active PRN orders for all pain scores, percentage of inappropriate medication administrations based on reported pain score, percentage of appropriate medication administrations resulting in no improvement in pain level, and the percentage of time pain was reassessed 1 hour after medication administration. For inappropriate medication administrations, we will investigate whether this was caused by a missing order. We will also assess whether patients on prescription pain medications prior to hospital admission or who received inappropriate pain medication administration at the hospital had an increased length of stay.

Methods: This is an IRB approved retrospective chart review of patients admitted to a large academic hospital who received at least one dose of an analgesic pain medication, determined by using the hospital electronic health record. Inclusion criteria comprise patients at least 18 years old, who were admitted to the general service and who received at least one administration of an analgesic pain medication during the three month study period. Exclusion criteria consist of patients with sickle cell disease, HIV, cancer pain, cancer or HIV diagnosis, or on patient controlled analgesia. We are collecting baseline demographics, pain medication orders, reported pain scores, assessment of pain 1 hour post-administration (per hospital policy), indications, and other pharmacologic agents received by patients that may alter pain based on indication (e.g. antidepressants, anticonvulsants).

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Sarah Lapsker, PharmD Candidate

Organization: Midwestern University Chicago College of Pharmacy

Authors: Sarah E. Lapsker, PharmD Candidate, Midwestern University Chicago College of Pharmacy, Loyola University Medical Center; Anne K. Reda, PharmD Candidate, Midwestern University Chicago College of Pharmacy, Loyola University Medical Center; Danya Faruqi, PharmD Candidate, Midwestern University Chicago College of Pharmacy, Loyola University Medical Center; Tran H. Tran, PharmD, BCPS, Midwestern University Chicago College of Pharmacy, Loyola University Medical Center.

Category: Student

Title: Descriptive evaluation of IV Calcium use in the setting of acutely elevated serum potassium at a tertiary academic institution

Purpose: Guideline recommendations regarding the use of calcium for the management of hyperkalemia vary, particularly in the absence of new ECG changes. The aim of this research is to evaluate the use of IV calcium in the setting of elevated serum potassium and describe its use in the absence of ECG changes.

Methods: This retrospective medical record review will examine patients age 18 to 89 years admitted to Barnes-Jewish Hospital from July 1, 2015 through June 30, 2016 with serum potassium > 5.0 mEq/L and an order for IV calcium gluconate or calcium chloride. Patients will be excluded if they receive a single dose of IV calcium in excess of 3 grams, a continuous infusion of IV calcium, or have an indication other than elevated serum potassium, i.e. calcium channel overdose, beta blocker overdose, hypocalcemia, or hypoparathyroidism. The primary outcome will be the proportion of all IV calcium orders administered without ECG changes present. ECG abnormalities, i.e. peaked T-waves, widened QRS interval, absent P wave, or PR interval prolongation, if not clearly attributed to elevated serum potassium in the ECG report will be reviewed by a physician for final adjudication. Secondary outcomes include proportion of IV calcium administrations based on potassium level, total initial and cumulative calcium dose, additional hyperkalemia therapies received, incidence of hyperkalemia and hypercalcemia at twenty-four hours, length of stay, and the proportion of orders input through a hyperkalemia order set.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: David Ross, PharmD Candidate

Organization: St. Louis College of Pharmacy

Authors: David G. Ross, PharmD Candidate 2017, St. Louis College of Pharmacy; Aaron P. Hartmann, PharmD, BCPS, Assistant Professor of Pharmacy Practice, St. Louis College of Pharmacy; William B. Call, PharmD, BCPS, Assistant Professor of Pharmacy Practice, St. Louis College of Pharmacy.

Category: Residency

Title: Levetiracetam vs. lacosamide for seizure prophylaxis

Purpose: Levetiracetam is a common anti-epileptic drug (AED) used for seizure prophylaxis in patients with neurologic trauma. At the University of Missouri Hospital, the use of lacosamide for seizure prophylaxis has recently increased due to suspected recurrence of CNS adverse effects with levetiracetam therapy. The purpose of this study is to determine whether lacosamide is associated with less CNS events when compared to levetiracetam for seizure prophylaxis in patients with traumatic brain injury (TBI) or intracranial hemorrhage (ICH).

Methods: This retrospective, single-center study includes patients >18 years old admitted to the hospital who received levetiracetam or lacosamide for seizure prophylaxis from July 1, 2015 to September 30, 2016. Neurologic indications for seizure prophylaxis include TBI and ICH. The study excludes patients if they were diagnosed with an underlying seizure disorder, on AED therapy prior to admission, or if seizure prophylaxis involves a brain mass or craniotomy. The primary outcome is a composite safety endpoint of CNS adverse events including somnolence, fatigue, agitation, anxiety, irritability, depression, and altered mental status. Secondary endpoints include incidence of seizures, mean number of days in the hospital, and mean number of days in the intensive care unit (ICU). The incidence of CNS adverse effects in patients on lacosamide and levetiracetam will be analyzed using chi-square. Mean time (in days) of hospital and ICU length of stay will be analyzed with the student's two-tailed t-test.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Stephanie Hipp, PharmD

Organization: University of Missouri Health Care

Authors: Stephanie Hipp, PharmD, PGY1 Pharmacy Resident, University of Missouri Health Care; Ashley McCormick, PharmD, BCPS, Clinical Pharmacy Specialist, University of Missouri Health Care; Jennifer Hedgecorth, PharmD, BCPS, Clinical Pharmacy Specialist, University of Missouri Health Care.

Category: Residency

Title: Pharmacist interventions in the emergency department and associated medication error prevention and cost avoidance

Purpose: To perform a descriptive analysis of pharmacist interventions in the emergency department and the associated cost avoidance from medication error prevention. Primary objective is to describe types of pharmacist interventions made in the emergency department and the secondary objectives are to report the potential cost avoidance associated with types of pharmacist interventions and evaluate the usefulness of retrospective pharmacist order review.

Methods: Pharmacist interventions will be documented by a pharmacist who is on-site performing retrospective order review in the emergency department. The interventions will be documented in the electronic medical record, EPIC software, using a customized intervention that will be designed for use by pharmacists only in the emergency department. Epic intervention (I-vent) activity is customized to capture accepted interventions and I-vents prompted by order review are linked to associated orders. When a pharmacist makes an intervention the name of the I-vent is SLH ED Research Only and the subtype field lists all of the different types of interventions. Based on the intervention chosen the value field will auto-populate with the associated cost avoidance value. The types of interventions and associated cost avoidance values per unit are: ADE Prevention (Major) \$2,200, Medication Reconciliation (ADE Major) \$2,200, Medication History \$642, ADE Prevention (Minor) \$220, Medication Reconciliation (ADE Minor) \$220, Medication Teaching/Discharge Education \$208, Dose Adjustment by Pharmacy \$112, Pharmacokinetic Consult \$100, Drug Information (Major) \$100, Antibiotic Optimization \$90, New Therapy Recommended \$75, Drug Information (Minor) \$20, and Clarify Drug Order \$0. The cost avoidance values are calculated utilizing Action-OI values. All data extracted from the I-vent will be recorded without patient identifiers and an I-vent report will be generated into an EXCEL spreadsheet. Data will be used to demonstrate the value of pharmacists in the emergency department at Saint Luke's Hospital.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Lynsee Lanners, PharmD

Organization: Saint Luke's Hospital of Kansas City

Authors: Lynsee R. Lanners, PharmD, PGY1 Pharmacy Practice Resident, Saint Luke's Hospital of Kansas City; Stephanie A. Burton, PharmD, BCPS, Clinical Pharmacist II, Saint Luke's Hospital of Kansas City; Tyler E. Barnes, PharmD, BCPS, Clinical Pharmacist II, Saint Luke's Hospital of Kansas City; Lindsay R. Massey, PharmD, MS, BCPS, Pharmacy Operations and Medication Safety Manager, Saint Luke's Hospital of Kansas City.

Category: Residency

Title: Evaluation of Sugammadex Use for Neuromuscular Blockade Reversal at an Academic Medical Center

Purpose: Sugammadex (Bridion®) is the only FDA-approved medication for immediate neuromuscular blockade reversal by non-depolarizing neuromuscular blockade agents, rocuronium and vecuronium. The mechanism of action is sequestering free molecules of the drug into a complex; thereby, reducing free muscle relaxant concentration and causing a rapid offset of neuromuscular blockade. The dose of sugammadex depends on the intensity of block administered to the patient, with 2 mg/kg single dose utilized for moderate block reversal and 4 mg/kg single dose for deep block reversal. Dosing is based on actual body weight, although administration based upon adjusted body weight in obese patients has been successfully described. Sugammadex has shown greater effectiveness at reducing train of four recovery time in three trials compared to neostigmine ± glycopyrrolate. Adverse reactions reported in phase III studies were comparable between sugammadex and neostigmine; the most common reactions included: procedural pain, nausea, and vomiting. The group purchasing organization cost for University of Missouri Health Care (MUHC) for a 200 mg vial of sugammadex was comparable to glycopyrrolate 1 mg + neostigmine 10 mg. Sugammadex was approved for use with restrictions at MUHC, defined as medication that requires certain criteria to order or is restricted to specific locations or providers. Preferred use of actual body weight, a consideration for capping an initial dose of 200 mg and limitation to anesthesia were the authorized criteria for sugammadex use. The purpose of this study is to evaluate the use and cost analysis of sugammadex at MUHC.

Methods: A retrospective chart review was conducted for adult patients that received at least one dose of sugammadex at MUHC from October 1, 2016 to December 31, 2016. Prisoners and pregnant patients were excluded from the study. A sampling of 250 patients were randomly selected for evaluation. Patient demographic information, sugammadex dose(s), and neuromuscular blockade agent used for the procedure were collected from each patient's electronic medical record. The primary outcome was the number of sugammadex doses administered based on the patient's actual body weight. Secondary outcomes included: number of patients that required an additional "rescue" dose and cost-analysis of use compared to neostigmine/glycopyrrolate.

Results: Research in Progress. To be presented at meeting.

Conclusions: Research in Progress. To be presented at meeting.

Submitting Author: Jennifer Wiederrich, PharmD

Organization: University of Missouri Health Care

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