ACUTE KIDNEY INJURY WITH INTRAVENOUS VANCOMYCIN USED IN COMBINATION WITH OTHER NEPHROTOXIC MEDICATIONS: A RETROSPECTIVE CHART REVIEW Katherine Albright, Carrie Sorenson, Katie Deutsch, Jennifer Paluh, Debra McPherson, CHI St. Alexius Health, 900 E Broadway Ave, Bismarck, ND 58501. kealbright@primecare.org.

As antibiotic resistance rates increase in both high-risk and general patient populations, the empiric use of vancomycin is becoming more common. Vancomycin has a known risk of acute kidney injury and its concurrent use with other nephrotoxic agents, especially in patients with additional risk factors for nephrotoxicity, increases a patient's likelihood for developing acute kidney injury. Recently, there has been an increase in literature published regarding the concurrent use of vancomycin and piperacillin/tazobactam leading to a significantly increased risk of nephrotoxicity. Despite this literature, patients are often placed on this combination of antibiotics. Unfortunately, there are currently no recommendations at CHI St. Alexius Health regarding the use of vancomycin used in conjunction with other nephrotoxic medications or in patients at a higher risk for developing nephrotoxicity.

The purpose of the study is to analyze the incidence of acute kidney injury associated with intravenous vancomycin and how the incidence is affected by specific factors, including concurrent use with other nephrotoxic medications, dosing of vancomycin, and vancomycin trough levels.

These objectives will be assessed through retrospective chart review of patients treated with intravenous vancomycin for greater than 48 hours.

The results of the study will be used to assess for possible recommendations regarding the administration of intravenous vancomycin when used in patients with nephrotoxic risk factors at CHI St. Alexius Health, in order to improve patient care.

Learning Objective:
Identify relevant factors that affect the incidence of acute kidney injury associated with vancomycin use

IMPACT OF PHARMACY MANAGED OUTPATIENT SERVICES ON VOLUME OF PATIENT-PHYSICIAN VISITS AS FAMILY MEDICINE/OBSTETRICS CLINIC Dialo Ambari, Ethan Osborn, Laura MacCall, Karrie Derenski, Cox Medical Center Branson, 525 Branson Landing Blvd, Branson, MO 65616.
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Pharmacy managed outpatient services have shown to be favored by both patients and physicians based on quality of patient care provided by pharmacists in these settings and recent patient satisfaction surveys. Implementation of these services at CoxHealth is anticipated to free physician's time, hence, increase number of new patient-physician encounters.

The primary objective of this study is to evaluate the impact of these services on the number and duration of patient-physician encounters at CoxHealth Family Medicine and OB clinics. Secondary endpoints include total number of pharmacist interventions, medication reconciliation errors fixed, physician acceptance rate of pharmacist recommendations, number of discontinued medications, and pharmacist hours designated to clinic service.

In this quasi-experimental study, the number of physician-patient encounters and duration of each encounter from 12/01/2016 – 05/01/2017 and 12/01/2017 – 05/01/2018 will be collected from family medicine clinic electronic database. All data will be recorded without patient identifiers and maintained confidentially. Average change in number of patient-physician encounters and time patients spend per visit before and after implementation of pharmacy managed outpatient service will be calculated and compared to evaluate the real impact of these services.

Results of this study will be presented to hospital administration team for review and potential to start billing for these services.

Learning Objective:
Analyze significance of pharmacist led polypharmacy services.

Glycoprotein IIb/IIIa inhibitors can play an important role in maximizing clinical outcomes in patients undergoing percutaneous coronary intervention (PCI) by reducing the incidence of adverse ischemic events including death, myocardial infarction, and the need for target vessel revascularization. Tirofiban and eptifibatide are the newest and most commonly used agents in this class; however, few studies have provided a direct, head-to-head comparison of the two agents in terms of clinical safety and efficacy. Practice also continues to change with the introduction of potent oral P2Y12 inhibitors, allowing for shorter bridging with intravenous antiplatelet inhibitors.

The primary objective of this study is to compare a composite of in-hospital cardiovascular outcomes (target vessel revascularization, CABG, ischemic stroke, recurrent STEMI, and death) and bleeding (both major and minor) events with high-dose bolus (HDB) tirofiban with shortened infusion versus short-duration eptifibatide as adjunctive therapy for PCI. Secondary objectives include comparing individual cardiovascular events, bleeding events alone, and costs between HDB tirofiban with shortened infusion versus short-duration eptifibatide.

These objectives will be assessed via a single-center, retrospective cohort study of patients who underwent PCI with short-duration eptifibatide adjunctive therapy between February 1, 2014 and February 1, 2016 or with HDB tirofiban adjunctive therapy between February 1, 2016 and October 1, 2017.

The results of this study will help provide additional information on the clinical safety and efficacy of HDB tirofiban with shortened infusion versus short-duration eptifibatide as adjunctive therapy for PCI due to the current deficit of direct comparisons of these agents in the literature.

Learning Objective:
Discuss the clinical efficacy and safety of short-duration glycoprotein IIb/IIIa inhibitors as adjunctive therapy for percutaneous coronary intervention.

EVALUATING THE EFFECTS OF FLAT-BASED ORAL ANTINEOPLASTIC DOSING IN PATIENTS WITH BODY MASS INDEX EXTREMES  Sarah M Anderson, Jacob Hobbs, Grant Middendorff, 1000 E 23rd St, Sioux Falls, SD 57105.

Providing efficacious dosing while minimizing adverse effects is an essential goal in the management of oral antineoplastics. Factors such as body mass index may impact a patient’s therapy course by altering the pharmacokinetics or pharmacodynamics of the medication. Guidelines providing recommendations for intravenous chemotherapy dosing in obese patients exist; however, literature discussing the impact of weight extremes on flat-dose oral antineoplastics is currently lacking. The purpose of this study is to assess the impact of weight extremes in regards to progression or toxicity associated with flat-dose oral antineoplastics.

This retrospective study will analyze patients receiving flat-dose oral antineoplastics prescribed for an FDA-labeled indication. It will focus on those who received care at an ambulatory oncology clinic and its outreach facilities from January 2014 through July 2017. Data collection will occur through electronic medical record chart reviews. The primary endpoint of the study will be the median relative dose intensity of each antineoplastic agent stratified by BMI classification (BMI less than 18.5, 18.5-29.9, or greater than 30 kilograms per square meter). The oral antineoplastics to be evaluated will include: alectinib, ceritinib, crizotinib, dabrafenib, dasatinib, erlotinib, everolimus, ibrutinib, imatinib, olaparib, pazopanib, regorafenib, sorafenib, sunitinib, and trametinib. Secondary endpoints will include six-month progression free survival as well as incidence and type of grade 3 and 4 adverse events, each stratified by BMI and disease state. The results of the study will be presented to a provider group to assess potential impacts on prescribing practices.

Learning Objective:
Describe the potential impacts of body weight extremes, both obesity and cachexia, on medication pharmacokinetics and pharmacodynamics.
Biologic drugs represented 36% of new Food and Drug Administration (FDA) approvals in 2017. Four of the top ten medications by sales are biologics. Adalimumab (Humira), the top drug by spending in 2016, increased in sales from $4.5 billion in 2012 to $13.6 in 2016, an annual rate of 16.7%. This outpaced the increase in total drug spending in the United States (US) which grew from $317.8 billion to $450 billion between 2012 and 2016, an annual increase of 7.3%.

Biosimilars entered the US market after the Biologics Price Competition and Innovation Act (BPCIA) outlined an abbreviated pathway for approval in 2013. The totality of evidence approach adopted by the FDA to evaluate biosimilars allows for the extrapolation of data across indications without requiring the manufacturer to conduct clinical trials for each indication. This translates to a decrease in cost of biosimilars by 10-30%, which reduces cost burden for both patients and the health system. Just as biosimilars are evaluated differently by the FDA, institutions must utilize a different approach to the formulary evaluation process of biosimilars compared to traditional small-molecule drugs.

The purpose of this study is to assess a new approach to evaluate whether a biosimilar should be added to formulary and which biosimilar should be added if multiple biosimilars have been approved for a single originator product. The results will be used to implement changes within The University of Kansas Health System Pharmacy & Therapeutics Committee to improve the formulary evaluation process of biosimilars.

Learning Objective:
Explain the FDA biosimilar approval process and how the labeled indications and cost considerations impact the Pharmacy & Therapeutics committee’s evaluation and decision.
EVALUATION OF HIGH-DOSE METHOTREXATE SERUM CONCENTRATION REQUIREMENT FOR DISCHARGE

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High-dose methotrexate (HDMTX) (doses > 500 mg/m²) is used to treat a variety of malignancies. Administration of HDMTX requires inpatient admission for supportive care and monitoring for toxicities such as nephrotoxicity and mucositis. Standard practice is to monitor MTX levels to determine the intensity and duration of supportive care measures. The data supporting safe and appropriate MTX levels for patient discharge is guided by literature from the 1970-80s and lacks specific recommendations. As a result, variation of institutional practices has been observed but commonly ranges between ≤ 0.1 or 0.05 microMol/L. It is unknown if the mentioned documented MTX level is warranted for safe discharge.

The purpose of this study is to evaluate the safety of discharging patients once the HDMTX level is ≤ 0.3 microMol/L. The primary outcome is to identify the number of toxicity-related interventions required after the HDMTX level is ≤ 0.3 microMol/L. Secondary outcomes include identification of interventions such as leucovorin, sodium bicarbonate, or fluid adjustments, glucarpidase administrations, length of hospitalization, post-discharge complications, average proportion of daily logarithmic change in serum MTX and average MTX serum concentration at discharge.

This retrospective cohort study includes adult patients with malignancies admitted to our institution for HDMTX between 2014-2017. Descriptive statistics will be used to analyze the data.

The findings of this study will be used to design a prospective pilot evaluating an identical primary outcome. If proven safe, such changes to our institution’s practice could contribute to decreased length of stay, cost savings, and increased patient satisfaction.

Learning Objective:
To discuss the safety of discharging appropriate patients once the high-dose methotrexate level is ≤ 0.3 microMol/L

VTE PROPHYLAXIS AND BLEEDING EVENTS IN PATIENTS WITH END-STAGE LIVER DISEASE

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It has long been thought that patients with cirrhosis are autoanticoagulated due to a tendency to present with an elevated INR. Consequently, many of these patients do not receive venous thromboembolism (VTE) prophylaxis during admission to the hospital. In current practice, a patient with normal liver function admitted as an inpatient would be administered VTE prophylaxis if they meet certain criteria. Guidelines for clinicians to prescribe appropriate prophylaxis for individual patients with liver disease are lacking. CHEST and AASLD guidelines do not expressly state which patients with liver disease to give or withhold pharmacologic VTE prophylaxis. Due to this lack of guidance, the decision to provide VTE prophylaxis in this patient population is often based on individual practitioners’ discretion and weighing of the risks of potential thrombosis with a potential bleeding event.

The primary objective of this study is to evaluate bleeding events in patients with ESLD (end-stage liver disease) who receive VTE prophylaxis compared to those who do not receive VTE prophylaxis. Additionally, the type of bleeding event (major vs. non-major), rate of VTE/portal vein thrombosis (PVT), and inpatient mortality rate will be evaluated.

This is a retrospective cohort review designed to evaluate the incidence of bleeding events in ESLD patients. Patient charts were reviewed for inclusion/exclusion criteria, bleeding criteria, baseline characteristics and other pertinent data to evaluate trends and occurrences.

The results of this study will be used to identify trends in prescribing VTE prophylaxis, number and type of bleeding events, incidence of VTE/PVT, and inpatient mortality rate.

Learning Objective:
Describe bleeding events in patients with ESLD who receive VTE prophylaxis compared to those who do not receive VTE prophylaxis
ASSESSING THE VALUE OF UNIT-BASED EMERGENCY DEPARTMENT PHARMACY SATELLITE SERVICES
Akeem O. Bale, A. Carmine Colavecchia, Amanda Beck, Daniela Espino, Kimberly Dubose; Thani Gossai, Linda Haines, Houston Methodist Hospital, 6565 Fannin Street, Houston, TX 77030. abale@houstonmethodist.org

Approximately 141 million patients visit the emergency department (ED) annually representing 45 visits per 100 persons. The increase in hospital ED visits may lead to patient overcrowding that contributes to medication errors and delays. Prior to 2016, the ED at the Houston Methodist Hospital (HMH) had 23 beds with limited clinical pharmacy services provided by a clinical specialist. In 2016, the ED expanded to 39 beds with a volume of approximately 42,000 annual patient visits. The increased patient volume—including critically ill holding patients—necessitated more proximate, dedicated pharmacy resources. In July 2017, a satellite pharmacy was implemented in the ED to provide pharmacy services.

This quasi-experimental study will assess the impact of ED satellite pharmacy services implemented in July 2017 at HMH. Satellite pharmacy services are provided between the hours of 07:00 and 22:00, seven days a week. The primary objective of the study is to evaluate medication turnaround time (TAT) from order entry to administration of STAT non-automated dispensing cabinet (ADC) medications before and after the implementation of the ED satellite pharmacy. Ten non-ADC medications dispensed from the satellite pharmacy were identified using IV workflow technology. The medication TAT were obtained from the electronic health records for 24 weeks pre and post satellite implementation with a five week washout period.

Preliminary results reveal improved turnaround time of 16 minutes and increasing nursing satisfaction. Data analysis is ongoing; final results will be presented.

Learning Objective:
Discuss the value of a unit-based satellite pharmacy in an emergency department

ASSOCIATION BETWEEN DEGREE OF GLYCEMIC CONTROL AND 10-YEAR FRACTURE RISK IN ELDERLY VETERANS
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There is evidence correlating diabetes with an increased risk of fractures, however, there is limited and mixed evidence regarding the degree of glycemic control and its impact on fracture risk. Three different retrospective cohorts, one prospective cohort, and one randomized controlled trial with different populations and limitations found different conclusions. The current evidence suggests poorly controlled diabetes with HbA1C levels of ≥9% and tightly controlled diabetes with HbA1C <6.5% are both associated with higher risks of fractures. Currently, there is conflicting evidence when comparing the fracture risk of the different average HbA1C levels that are in between 6.5% and 9%. This study is designed to determine the correlation between the average HbA1C <7.0%, 7.1-8.0%, 8.1-9.0%, and >9% and 10 year fracture rate in elderly veterans.

This study aims to clarify the risks of different HbA1C goals in a real-world setting to help guide patients and providers set appropriate treatment goals. This is a retrospective chart review, multisite study utilizing data from veterans to compare the average HbA1C with the 10-year fracture risk. The primary outcome of this study will compare the 10-year fracture rate in patients without diabetes versus diabetes with average achieved HbA1C ranges of ≤7.0%, 7.1-8.0%, 8.1-9.0%, and >9%. The 10-year event rate of primary and secondary outcome events will be compared using the Cox Proportional Hazards model/Regression analysis. Descriptive statistics will be evaluated using Chi-Squared and continuous data using an ANOVA to determine between group differences for any significant confounding variables.

Learning Objective:
Recognize the association between degree of glycemic control and fracture risk.
Invasive fungal infection (IFI) is a significant cause of morbidity and mortality in immunocompromised patients. Use of antifungal agents as prophylaxis may mitigate IFI risk, and posaconazole, a newer azole antifungal, has been used in these high-risk patients. In recent years, a delayed-release tablet (DRT) of posaconazole was created due to erratic absorption of the original oral-suspension formulation. Therapeutic drug monitoring (TDM) following administration of posaconazole DRT has demonstrated supratherapeutic posaconazole concentrations leading to potentially unnecessary toxicity. The objective of this study is to determine if dose reduction of prophylactic posaconazole DRT leads to change in clinical efficacy.

Immunocompromised patients receiving posaconazole DRT for prophylaxis against IFI will be analyzed in this retrospective, single-center cohort study. The primary endpoint is the rate of IFI in patients receiving reduced doses of posaconazole DRT compared to those receiving standard prophylactic doses using Cox modeling to explore the relationship between survival and IFI. Secondary endpoints include describing posaconazole DRT dosing changes based on resultant serum trough levels and adverse events associated with elevated posaconazole DRT concentrations, reporting target range attainment in patients in whom the dose of posaconazole DRT was reduced, and evaluating how frequently dose-adjustments are made in the setting of resultant troughs.

Our study could increase the prominence of pharmacists in several core elements of antimicrobial stewardship by ensuring the safe and efficacious use of posaconazole DRT when coupled with TDM. It will also contribute to the limited body of literature surrounding the utility of TDM for IFI prophylaxis.

Learning Objective:
Explain the relationship between dose-adjustment of posaconazole DRT and rates of invasive fungal infection.

Tacrolimus, the calcineurin inhibitor of choice in kidney transplantation, requires regular trough level monitoring for determination of efficacy and safety. Due to patient characteristics, there can be high intra- and inter-patient variability in tacrolimus exposure. A small subset of literature analyzes the use of tacrolimus concentration-to-dose (C/D) ratios as a surrogate for metabolism. Low C/D ratios, or higher metabolism, correlates with worse graft function and higher incidence of biopsy-proven acute rejection (BPAR). We aim to explore the differences in outcomes between high, intermediate and low tacrolimus metabolizers in a large, diverse population transplanted at our institution.

The objective of this study is to determine if there is a relationship between tacrolimus C/D ratios and graft outcomes in patients who received a kidney transplant at a large transplant center between January 1, 2006 and August 17, 2016. Inclusion criteria consists of adult (kidney transplant) recipients who received antithymocyte globulin induction followed by a maintenance regimen of tacrolimus, mycophenolate and prednisone. The primary endpoint is BPAR at 1 year. We hypothesize that patients with a low C/D will have higher BPAR rates, inferior graft function and survival compared to those with a high C/D. Clusters will be determined by time-weighted C/D ratios and used in Tarone-Ware calculations for Kaplan-Meier estimates.

The total population included 1373 kidney transplant recipients. The mean C/D ratios for clusters 1, 2 and 3 were 0.88, 2.01 and 3.87, respectively. For the primary endpoint of BPAR there was no statistically significant difference between the three C/D clusters.

Learning Objective:
Discuss the impact of tacrolimus concentration-to-dose ratios on kidney transplant outcomes including biopsy-proven acute rejection, graft survival and patient survival.
IMPACT OF ENHANCED RECOVERY PROTOCOLS ON OPIOID UTILIZATION AND PRESCRIBING AT NEBRASKA METHODIST HOSPITAL  Brian Bautista, Stacey Miskie, Michael Koraleski, Nebraska Methodist Hospital, 8303 Dodge Street, Omaha, NE 68114. brian.bautista@nmhs.org

Opioid overuse has become a priority issue as a result of increased rates of adverse events, dependence, abuse, and addiction. This has led to healthcare organizations adopting changes in practice for the purpose of opioid guardianship. One such approach that has shown promise is the implementation of enhanced recovery protocols for patients undergoing surgical procedures. At its core, enhanced recovery incorporates various preoperative, intraoperative, and postoperative concepts in order to achieve improved patient outcomes. These include multimodal analgesia, management of preoperative diet and hydration, maintenance of intraoperative euvoolemia, and early postoperative mobilization, among others.

The purpose of this study is to evaluate opioid use in surgical patients before and after implementation of enhanced recovery protocols at Nebraska Methodist Hospital. Post-op opioid administration as well as discharge orders for opioids will be assessed. For the secondary endpoint, average pain scores from 0-4 hours POD-0, 5 hours - end of POD-0, and POD-1 time-points will be analyzed to compare pain control pre- and post-enhanced recovery protocol implementation.

Subjects will be assigned to one of two groups – pre-enhanced recovery protocol implementation or post-enhanced recovery protocol implementation. A retrospective review of patient records will be performed to compare opioid use between these groups. Subjects will be matched by procedure and by primary surgeon to help control the confounding potential of surgeon technique variability.

The results of this study will be used to drive future quality improvement initiatives related to surgical protocols, pain management, and opioid prescribing at Nebraska Methodist Hospital and its affiliates.

Learning Objective:
The learning objective of this study is to compare opioid use in surgical patients before and after implementation of enhanced recovery protocols at Nebraska Methodist Hospital.

SURVEY OF CLINIC PROVIDERS ON THE INITIATION OF PHARMACIST-LED AMBULATORY SERVICES Katelyn Beachner Janine Ohler, Christina Graham, Lawrence Memorial Hospital, 325 Maine, Lawrence, KS 66044. katelyn.beachner@lmh.org

Lawrence Memorial Hospital (LMH) is a community hospital that offers an abundance of outpatient services in specialty and primary care clinics. LMH primary care clinics have recently transitioned to a Patient-Centered Medical Home (PCMH) model. PCMH clinics have set standards and guidelines to ensure patients are at the forefront of care by building relationships between patients and their clinical care team. Pharmacists will play a crucial role on this team by addressing many of the PCMH-specific competencies, including but are not limited to, targeting medication therapy, safety and care management. The advantages of similar patient care models have been demonstrated in studies, such as Dr. Ye and colleagues’ cost-effect analysis of pharmacist care for diabetes in prevention of cardiovascular diseases. Patients with heart failure, diabetes, hypertension, and hyperlipidemia are primarily medication managed and may be positively impacted by the care of a pharmacist. Pharmacist access to such patients in the ambulatory care setting, may optimize their medication therapy and improve clinical outcomes.

The purpose of this study is to describe the chronic disease states of highest need for pharmacy clinical services from the perspective of clinic providers.

The objective will be assessed through a survey completed by providers in three primary care clinics. Descriptive statistics will be calculated based on survey response.

The results of this study will be used to prioritize the initial pharmacist-led chronic disease management services implemented in the primary care setting.

Learning Objective:
Describe the areas in a primary care clinic that pharmacists can provide chronic disease state management.
EVALUATION OF PRESCRIBING PRACTICES FOR INPATIENT FENTANYL PATCHES FOLLOWING IMPLEMENTATION OF AN ELECTRONIC MEDICAL RECORD ALERT  Julie Beck, Matt Baker, Jenna Stang, Michael Kallenberger, Jeremy John, North Kansas City Hospital, 2800 Clay Edwards Dr, North Kansas City, MO, 64116. Julie.Beck@nkch.org

Initiation of fentanyl patches in opioid naïve patients can result in significant morbidity and mortality. The fentanyl patch package insert outlines the necessary parameters for opioid tolerance. To warn about proper initiation of fentanyl patches, the FDA and ISMP have released warning statements defining opioid tolerance and offer guidance on appropriate prescribing. The primary objective of this study is to evaluate the change in fentanyl patch initiations that are prescribed to opioid tolerant vs opioid naïve patients before and after the implementation of an electronic medical record alert. Secondary objectives include assessing the frequency of appropriate dose conversion to fentanyl and comparing the incidence of naloxone use, falls, and death within 7 days of patch initiation.

A retrospective review of inpatients at a 450-bed community hospital, initiated on a fentanyl patch, was performed to assess alignment with current evidence and package insert recommendations. Patients with a history of fentanyl patch usage in the prior 60 days were excluded. After the initial review an electronic medical record alert will be implemented to instruct pharmacists to verify the patient meets the opioid tolerance criteria and to consider other clinical factors such as age, BMI, and concurrent medications. After implementation of the alert, patients started on fentanyl patches will be compared to the pre-intervention group to assess changes in the primary and secondary objectives. The Institutional Review Committee approved this study.

The results of this study will be used to determine if this alert results in improved alignment with best practice.

Learning Objective:
Define opioid tolerance in terms of the required duration of therapy, minimum daily dose and what clinical patient factors may justify a lower initial dose.

IMPLEMENTING A PHARMACIST DRIVEN ADHERENCE PROGRAM FOR INSULIN NAÏVE DIABETICS Adam Beeler, Sarah Daniel, Jim Langley. The University of Kansas Health System, 4000 Cambridge St., Mailstop 4040, Kansas City, Kansas 66160. abeeler2@kumc.edu

Insulin naïve patients are a vulnerable subset of the diabetic population, but not enough research has been done to measure how pharmacist interventions improve adherence to diabetic medications in this population. Pharmacist’s interventions have been shown to improve other metrics relating to medication use; however there is limited evidence to support their effect on adherence to insulin. By implementing a pharmacist driven adherence program for this patient population, the goal is to decrease barriers patients may have to becoming successful with their diabetic regimen, specifically insulin. Key components of this adherence program involve re-education and counseling on diabetic medications, insulin use, blood-glucose monitoring, and lifestyle modifications. The purpose of this study is to investigate whether a pharmacist driven adherence program can increase adherence to diabetic medications for insulin naïve patients receiving their first insulin prescription in an academic health system outpatient pharmacy, measured by proportion of days covered. A secondary purpose is to assess adherence factors for insulin naïve patients. A final purpose is to measure the overall amount of insulin prescriptions captured at the University of Kansas Health System.

Based upon the results of the study, the data will be used to implement outpatient pharmacy workflows surrounding medication adherence. Furthermore, if the results prove to be beneficial to patient care, this workflow could be applied to other patient populations that are considered high-risk for poor adherence.

Learning Objectives:
Discuss how education and counseling provided by a pharmacist in the outpatient retail setting to insulin naïve diabetic patients can impact adherence to diabetic medications.
EVALUATION OF MEDICATION ACCESSIBILITY AT DISCHARGE FROM AN INPATIENT BEHAVIORAL HEALTH CENTER  Natalie Beiter, Margaret Haberman, Lisa Rausch, Anne Morstad, Avera McKennan 1325 S. Cliff Ave PO Box 5045, Sioux Falls, SD 57117. natalie.beiter@avera.org

At discharge, patients commonly receive new prescriptions or changes to previous prescriptions which increases the risk for medication discrepancies and nonadherence.

The objective of this study is to identify deficiencies within the current discharge process as it relates to medications at an inpatient behavioral health center and evaluate their relationship to patient nonadherence and readmission rates at the facility.

This study has been submitted to and approved by the Institutional Review Board. The electronic medical record system will be used to identify patients discharged from the adult units of an inpatient behavioral health center and prescription medications those patients received at discharge. The following patient data will be collected: age, sex, insurance coverage, number of medications at discharge including previous home medications, change in dose or instructions, or new prescriptions, if patients received bubble packing or other special medication services, if patients received indigent services, day and time when discharge orders were placed, prior authorization requests made for new prescriptions, and reason for subsequent readmission to the facility within the study time period. Data will be collected and reviewed by the primary author and trained pharmacy staff to identify inconsistencies within the discharge process.

The results of this study will be used to implement changes in the discharge process at the inpatient behavioral health center to reduce the risks of medication discrepancies and nonadherence at discharge.

**Learning Objective:**
State three potential causes for medication discrepancies at discharge.

GLYCEMIC CONTROL IN PSYCHIATRIC INPATIENTS AFTER IMPLEMENTATION OF A CARBOHYDRATE-COUNTING, INSULIN-BASED REGIMEN  Nicole Bendon, Rosemary Dulac, Lynn Weber. Hennepin County Medical Center, 701 Park Avenue Minneapolis, MN 55415. Nicole.bendon@hcmed.org

Hyperglycemia has been associated with adverse outcomes including prolongation of hospital stay, increased rates of infection and increased mortality, yet inpatient glucose management continues to be a challenge at many institutions. Mental illness may compound this challenge. Medication refusal, low health literacy, metabolic medication side effects, and poor glycemic management prior to admission are all risk factors. There has been extensive investigation of glucose management in the critical care setting, but studies regarding glucose control in psychiatric inpatient populations are lacking.

In March 2015, Hennepin County Medical Center (HCMC) expanded the management strategy for psychiatric patients with diabetes to include carbohydrate-counting, meal-time insulin. This was additional to fixed-dose insulin, which was previously utilized. The primary objective of this study is to evaluate blood glucose levels before and after this change in process in order to determine appropriate patient management.

This study is a single-center, retrospective chart review of two cohorts of diabetic patients admitted to any of the psychiatric units at HCMC. Patients will be evaluated if they received fixed-dose, meal-time insulin prior to the practice change or if they received carbohydrate-counting, meal-time insulin after the process implementation. Descriptive statistics will be used to evaluate the data.

The results of this study will provide insight into the control of blood glucose in hospitalized psychiatric patients and may lay the foundation for future studies evaluating hospital-wide blood glucose control.

**Learning Objective:**
Identify whether glycemic control may be improved with carbohydrate-counting insulin regimens compared to fixed-dose regimens in a psychiatric inpatient population.
EVALUATING THE PROCESS OF IMPLEMENTING A CLINIC PHARMACY-BASED MEDICATION SYNCHRONIZATION PROGRAM FOR REFUGEE PATIENTS WITH CHRONIC DISEASE STATES: A QUALITATIVE CASE STUDY Trisha Benjamin, Kevin Fuji, and Jessica Skradski, Creighton University, 2412 Cuming Street Suite 201, Omaha, NE 68131. trishabenjamin@creighton.edu

Navigating the healthcare system is difficult for refugee patients managing chronic disease states and is further perpetuated by language and transportation barriers. Chronic diseases require multiple medications for control resulting in numerous refills at various times. Medication synchronization is a tool used by pharmacists to reduce pharmacy visits, which is helpful for patients with transportation concerns.

The purpose of this qualitative case study is to describe the development, implementation and evaluation of a medication synchronization program in a clinic pharmacy including barriers and facilitators to program success. Pharmacists in a clinic pharmacy will collaborate with nurses, medical assistants, medical residents and supervising physicians in an adjacent family medicine residency clinic to create a medication synchronization program for refugee patients. The American Pharmacists Association (APhA) appointment based model will be used to synchronize these patients’ medication refills.

This medication synchronization program is intended to improve communication between patient and providers, expand continuity of care, and reduce visits to the pharmacy which is helpful due to the transportation concerns for these patients. Observations and interviews will be conducted and documents will be gathered to understand perspectives of refugee patients, pharmacists, nurses, medical residents, medical assistants and supervising physicians involved in the implementation and sustainability efforts of this program.

The findings of this study will provide insight towards future implementation of this program across multiple locations.

Learning Objective:
Discuss the implementation of a medication synchronization program within a clinic pharmacy for refugee patients including insight regarding barriers and facilitators to the program success.

ANTI-XA MONITORING AND DOSING OF ENOXAPARIN FOR VENOUS THROMBOEMBOLISM PROPHYLAXIS IN OBESE TRAUMA PATIENTS Katherine Berning, James Bischoff, Todd Burkhardt, North Memorial Health, 3300 Oakdale Ave N, Robbinsdale, MN 55422. Katherine.berning@northmemorial.com

The North Memorial Health trauma venous thromboembolism (VTE) prophylaxis protocol utilizes monitoring of enoxaparin and dose adjustments based on anti-Xa levels. Current literature suggests peak anti-Xa levels less than 0.2 IU/mL pose increased risk of thrombosis, while peak anti-Xa levels of 0.2 to 0.4 IU/mL decrease VTE rates without increased risk of complications. Obese patients often require dose adjustments based upon sub-therapeutic anti-Xa levels.

The primary objective of the study was to identify the enoxaparin dose (mg/kg) utilized to achieve the therapeutic peak anti-Xa levels of 0.2 to 0.4 IU/mL within the obese trauma patient population. The secondary objectives were to identify the amount of time to achieve a therapeutic anti-Xa level after prophylaxis initiation, number of levels drawn prior to reaching a therapeutic level, number of dose changes done, and the rates of VTE and bleeding events.

A retrospective review was conducted to evaluate the monitoring and dosing of enoxaparin prophylaxis in obese trauma patients. Inclusion criteria were obese patients, defined as a BMI 30kg/m2 or greater, admitted to the trauma service and started on enoxaparin for VTE prophylaxis. Patients who met inclusion criteria were evaluated to identify the outcomes described by the primary and secondary objectives.

The results of this study will be used to improve patient care and reduce healthcare costs.

Learning Objective:
Discuss the potential impact of weight based dosing of enoxaparin for venous thromboembolism prophylaxis in the obese trauma patient population.
A REVIEW OF URINARY TRACT INFECTION INCIDENCE IN KIDNEY TRANSPLANT RECIPIENTS INTOLERANT TO TRIMETHOPRIM-SULFAMETHOXAZOLE  Jillian Bishop, Dennis Grauer, Nathan Oliver. 4000 Cambridge Street, Kansas City, KS 66160. Jbishop4@kumc.edu

Kidney transplant recipients (KTR) have a 23% to 75% increased risk of urinary tract infections (UTI) post-transplant. This complication is linked to an increased risk of sepsis, long-term kidney graft dysfunction, chronic rejection, and death. The KDIGO clinical practice guideline on kidney transplant recommends all KTRs receive trimethoprim-sulfamethoxazole (TMP-SMX) daily for at least six months following transplantation. TMP-SMX serves as the first line agent for prophylaxis against UTIs as well as Pneumocystis jiroveci pneumonia (PJP). A subset of patients cannot tolerate TMP-SMX, requiring an alternate PJP prophylaxis agent such as dapsone, pentamidine, or atovaquone. These alternate agents lack intrinsic activity against common UTI pathogens (e.g. Escherichia coli). Therefore, these patients go without adequate UTI prophylaxis. The objective of this study is to evaluate the need for UTI prophylaxis in patients on alternative PJP prophylaxis regimens as changes in immunosuppression regimens and post-transplant clinical management continue to evolve.

This is a retrospective review of all patients aged 18 and older who received a kidney transplant between January 1, 2015 and December 31, 2015 at the University of Kansas Health System (TUKHS). Data was collected from the electronic medical record at TUKHS for one year after the time of transplantation. Because clinical transplant practices vary from center to center, this review will contribute to the available literature by evaluating the incidence of UTI in a modern time setting, and will also assist in optimizing transplant infection protocols at TUKSH. This study was approved by the University of Kansas Institutional Review Board.

Learning Objective:
Recognize the need, or lack thereof, for UTI prophylaxis when patients are unable to tolerate TMP-SMX after a renal transplant.

INCIDENCE OF ACUTE KIDNEY INJURY (AKI) IN CRITICALLY ILL PATIENTS RECEIVING VANCOMYCIN WITH CONCOMITANT PIPERACILLIN/TAZOBACTAM, CEFEPIME, OR MEROPENEM  Adam Blevins; Jennifer Lashinsky; Paul Juang; Barnes-Jewish Hospital, One Barnes-Jewish Hospital Plaza, St. Louis, MO, 63110. adam.blevins@bjc.org

Current literature has shown an association between combination piperacillin/tazobactam plus vancomycin therapy and an increased risk of AKI. Although this association has consistently been shown in non-critically ill patient populations, only one study has evaluated this interaction in the critically ill patient population. This particular study was unable to identify a difference in nephrotoxicity between combination therapies; however, this study was underpowered to detect a difference. Critically ill patients have a large number of risk factors for AKI, and it is imperative that these risk factors are minimized to decrease the potential for additive toxicity.

The purpose of this study is to compare the incidence of AKI in critically ill patients receiving vancomycin in combination with piperacillin/tazobactam, cefepime, or meropenem. Through a retrospective chart review, patients were included that received combination vancomycin and one of the specified beta-lactams for greater than 48 hours. Patients were excluded if they had end stage renal disease, had repeated patient encounters, or cystic fibrosis.

The primary outcome of this study is the rate of AKI between groups, as defined by the KDIGO criteria. Secondary outcomes are the time to occurrence of AKI, progression of AKI to renal replacement therapy, AKI rates compared with vancomycin troughs, ICU and hospital length of stay, and in-hospital mortality.

The results of this study may provide evidence for the clinical significance of this interaction in critically ill patients and may impact empiric antibiotic selection in this patient population.

Learning Objective:
Discuss the evidence associating vancomycin and piperacillin/tazobactam with increased rates of acute kidney injury and how this applies to the critically ill patient population.
EVALUATION OF PHARMACIST AND PHYSICIAN MANAGED WARFARIN THERAPY IN AN ACADEMIC MEDICAL CENTER

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Warfarin sodium remains an inexpensive and effective oral anticoagulation option for treating patients with deep vein thrombosis (DVT), pulmonary embolism (PE) and atrial fibrillation. Evidence-based therapy for the initial warfarin treatment of DVT or PE suggests parenteral anticoagulation for a minimum of five days. Time to reach therapeutic international normalized ratio (INR) levels of 2 to 3 influences duration of parenteral therapy and possibly length of hospital stay. Appropriate management in an inpatient setting is essential to allow for prompt discontinuation of parenteral therapy at five days and for preventing supra-therapeutic INR levels. The objective of this study is to compare time to achieve therapeutic INR for warfarin between pharmacists and physicians at an academic medical center.

This retrospective chart review will identify patients that received warfarin for a new diagnosis of atrial fibrillation, DVT or PE from January 2015 to September 2017. The primary endpoint measured will be mean time in days to achieve therapeutic INR. Secondary endpoints will include percentage of patients achieving therapeutic INR by day 5, percentage of patients achieving supra-therapeutic INR (levels greater than 3), mean length of stay, inpatient days on warfarin, and total milligrams given to achieve therapeutic INR. Kaplan-Meier estimation, Z-test of proportion, negative binomial distribution and Mann-Whitney U test will be used where appropriate to compare endpoints.

The results of this study will be used to advocate for physicians’ consultation of pharmacy to assist in dosing and validation of warfarin dosing guidelines used at the academic medical center.

Learning Objective:
Discuss how effective and efficient dosing of warfarin affects time to reaching a therapeutic INR.

EVIDENCE-BASED EVALUATION OF MEDICAL MARIJUANA INFORMATION ON COMMONLY USED WEB SITES

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There are various studies, review articles, and guidelines that have been published regarding the potential medical uses of marijuana. However, these are often not easily accessible to the public, nor are they written at a level appropriate for the general public. This often leads to misinterpretation of the information.

The primary purpose of this study was to evaluate the accuracy of medical marijuana information on some of the most widely used Web sites. A secondary purpose of this study was to evaluate the quality of each Web site.

Commonly used Web sites containing information regarding medical marijuana were selected by utilizing three online tools that rank Web sites based on number of views, number of visitors, and visitor engagement. Web sites were included in this evaluation if they met certain predetermined criteria. Once the Web sites were chosen, medical claims regarding marijuana were reviewed by evaluating studies referenced within the text of medical marijuana publications on each Web site. The studies reviewed in this step were evaluated using an accepted evidence-based process. After reviewing the publications for accuracy, the overall quality of each Web site was evaluated using criteria published by the United States Food and Drug Administration.

While it is difficult to appropriately gauge the overall Web site reliability and quality, it is obvious that there is room for improvement on each Web site. The results of this study will be used to emphasize the importance of ensuring accuracy of information available on the internet.

Learning objective:
Describe the accuracy of the medical claims regarding medical marijuana on commonly used Web sites.

Vancomycin is a first-line agent for suspected methicillin-resistant Staphylococcus aureus (MRSA) infections. However, vancomycin dosing can be challenging and may require additional time and effort to ensure therapeutic trough levels are achieved. Due to changes in volume of distribution, creatinine clearance, and plasma proteins, achieving an adequate target vancomycin trough concentration while avoiding nephrotoxicity or therapeutic failure can be challenging in the obese population. Additionally, there is a lack of consensus guidelines on dosing strategies for vancomycin in these patients, making this a key area for additional investigation.

The purpose of this study is to compare retrospective data obtained from previous pharmacist-led dosing to data from prospective protocol-driven dosing in obese patients. Therapeutic trough concentrations and the number of doses needed to achieve therapeutic trough levels will be analyzed. Target therapeutic trough concentrations are 10-15 mcg/dL or 15-20 mcg/mL, depending on indication and goal set forth by the physician.

The results of the study will be used to implement changes in vancomycin dosing to improve achievement of adequate trough concentrations and to avoid subtherapeutic and supratherapeutic doses in obese patients.

Learning Objective:
Discuss vancomycin dosing in obese patients and report results from an obesity-focused dosing protocol compared to retrospective dosing data in an in-patient setting.

EVALUATION OF TOBACCO CESSATION CONSULT SERVICE IN A VETERANS AFFAIRS PHARMACY CLINIC, Shelby Boschult, Justin Frazer, Lisa Bilsland, VA Nebraska-Western Iowa Health Care System, 2201 N Broadwell Ave, Grand Island, NE 68803. shelby.boschult@va.gov

Pharmacy clinics within Nebraska-Western Iowa Health Care System assist veterans in tobacco cessation using medications and behavioral modifications. Veterans can be self-referred or referred by the provider. Tobacco cessation appointments comprise a large share of scheduled availability in pharmacy clinics. To better focus efforts to those veterans ready to quit tobacco, pharmacy service desired to look at various factors to assess the appropriateness of tobacco consults placed.

Consults, notes and medication orders were utilized to help gather all pertinent information. Data was collected for each patient at visit 0 (the visit associated with the date of consult) and up to three pharmacy visits. The primary endpoint was the rate of tobacco cessation consults discontinued.

Data was collected from April, 1 2017 to June 30, 2017. A total of 184 consults were placed with none discontinued. In patients successfully quit at last follow-up, the average motivation level was 9.22 and tobacco burden was 12.7 cigarettes. In those patients unable to quit, the average motivation level was 8.45 and tobacco burden 17.1 cigarettes. Of patients with medications ordered, 24.3% had medications ordered without an assessment of motivation or setting a quit date.

The rate of discontinued tobacco cessation consults would indicate that the consults placed are appropriate. However, when considering what translates to patients having more success and therefore an appropriate referral, it is important to consider other factors. Continued education may be necessary regarding the importance of determining patients’ readiness to quit tobacco prior to ordering tobacco cessation medications.

Learning Objectives:
Describe how veterans can be referred to pharmacy clinic for tobacco cessation.
Use of induction immunosuppression with rabbit anti-thymocyte globulin (rATG) in renal transplant recipients has been shown to provide beneficial outcomes but an optimal dosing regimen has yet to be established.

The objective of this study is to compare the efficacy and safety of three dosing regimens of rATG for induction immunosuppression during renal transplantation.

This is a single-center, retrospective, non-inferiority, comparative, cohort analysis conducted at Barnes-Jewish Hospital. We evaluated all adult renal transplant recipients from January 1, 1998 to March 1, 2017 who received rATG induction. We excluded all patients who received multi-organ transplants, those who received non-standard immunosuppression, as well as those who received doses of rATG outside of pre-defined ranges. Low-dose (3 mg/kg; range 2.5-3.5 mg/kg), mid-dose (5 mg/kg; range 4.5-5.5 mg/kg), and high-dose (6 mg/kg; 5.5-6.5 mg/kg) groups were evaluated. A comparison of patients at high and low rejection risk was performed based on pre-defined criteria.

The primary endpoints of this study include biopsy proven acute rejection, patient survival, and graft survival at 6 months post-transplant. Secondary outcomes include primary endpoints at 12 months, incidence of delayed graft function, time to first rejection episode, rejection severity (Banff classification), recurrent rejection rates, transplant hospitalization length of stay, incidence of cytomegalovirus viremia, and incidence of new malignancy post-transplant.

The results of this study will be used to determine the efficacy and safety of our current institutional practice and provide insight into the optimal dosing strategy of rATG when used for induction immunosuppression in renal transplant recipients.

Learning Objective:
Apply results of current research to a renal transplant recipient in regards to optimal dosing of anti-thymocyte globulin for induction immunosuppression
IMPLEMENTATION OF AN ORAL CHEMOTHERAPY ADHERENCE PROGRAM AT A RURAL CANCER CENTER
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Oral chemotherapy agents have become increasingly prominent in the treatment of cancer. Although these agents are convenient for the patient, there is concern regarding adherence. Lack of adherence to chemotherapy can lead to resistance, disease progression, and death. Therefore, it is imperative that patients be monitored for adherence to their therapies to reduce negative outcomes and improve overall health. According to the Quality Oncology Practice Initiative (QOPI) standards published in 2017, oral chemotherapy adherence must be monitored and documented. The pharmacist can play a crucial role in the monitoring and education of oncology patients receiving oral therapies.

The purpose of this project is to detail the process by which an oral chemotherapy adherence program was initiated at a rural cancer center, with a secondary purpose of evaluating patient adherence during the first six months of this program. Patient demographics, concomitant parenteral chemotherapy treatment, and reasons for any non-adherence will also be assessed.

Patient data will be collected from patient charts and de-identified. Adherence will be analyzed via follow-up phone calls or face-to-face contact with the patient made by pharmacy and nursing staff. A log of these phone calls will be kept for data collection purposes, as well as documented in the patient charts.

The results of this study will be used to guide the future of the now-permanent oral adherence program at Salina Regional Health Center, highlight the importance of pharmacist inclusion as a member of the cancer care team, and demonstrate the impact pharmacists can have on patient outcomes.

Learning Objective:
Outline the role of the pharmacist in the implementation of an oral chemotherapy adherence program at a rural cancer center.

EVALUATING AN ANTIMICROBIAL STEWARDSHIP INTERVENTION TO REDUCE ANTIBIOTIC PRESCRIBING IN ASYMPTOMATIC PATIENTS DIAGNOSED WITH URINARY TRACT INFECTIONS Amanda Brenneke, Heidi Calvin, Rudd Hetrick, Travis Kremmin Shawnee Mission Medical Center, 9100 W 74th St, Shawnee, KS 66204. amanda.brenneke@ahss.org

The negative impacts of over-prescribing antibiotics include drug resistance, development of multi-drug resistant pathogens, opportunistic infections, and increased health care costs. In most clinical situations, urinary tract infections (UTI) without physical symptoms should not be treated with antibiotics. For this study, unnecessary antibiotics are defined as being received by any patient for whom physical symptoms of a UTI are not documented in the electronic medical record. The objective of this study is to quantify and reduce unnecessary antibiotic prescribing.

This is a retrospective study of patients who received antibiotics for uncomplicated cystitis, complicated cystitis, and pyelonephritis. The control group includes patients who received antibiotics between August 1st and August 28th of 2017 prior to intervention. Based on findings in the control group, the intervention will target areas of highest concern. The treatment group will consist of patients who receive antibiotics between March 2nd of 2018 and March 29th of 2018 after intervention. Primary outcomes are the days of therapy and the number of doses of unnecessary antibiotics. Secondary outcomes will include length of stay and cost. In addition, demographic data, urinalysis findings, and urine culture results will be collected.

Learning Objective:
Define asymptomatic bacteriuria; identify and recognize the appropriate circumstances to treat patients with urinary tract infections.
Acid suppression therapy (AST) is widely used in both the inpatient and outpatient setting. When examining inpatient use of AST, stress ulcer prophylaxis (SUP) is a major component. This study evaluates the use of AST and SUP for patients in the intensive care unit (ICU). It will also present the associated risks of AST overuse such as pneumonia and C. difficile infections as well as increased facility costs.

A retrospective chart review is being completed using a list of patients admitted to the ICU from January 1, 2016 to August 31, 2017. Within the selected timeframe, review of 100 patient charts is the goal. Each patient profile is reviewed for therapeutic or prophylactic AST, and the appropriateness of use or lack of use will be determined based on current therapy recommendations from ASHP and additional literature sources. Patients in the ICU are assessed for gastrointestinal (GI) bleeding risk factors that indicate use of AST, appropriate drug therapy selection, and discontinuation of therapy. Appropriate cessation of AST is determined by the patient’s resolution of GI bleeding risk factors, transfer to a rehabilitation/transitional care unit, or discharge from the facility. Associated costs of unnecessary AST will also be examined.

The purpose of this study is to evaluate this facility’s AST use in comparison to the available guidelines. Results of this study will allow us to identify any areas of improvement and determine the possible benefits of an AST pharmacist-driven protocol.

**Learning Objective:**
Identify patients in the hospital who need acid suppression therapy based on medical conditions and/or risk factors.
IMPLEMENTATION OF A TEAM-BASED PSYCHOPHARMACOLOGY CONSULT SERVICE FOR RURAL CLINICS
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Telemedicine is defined as the delivery of clinical services to distant populations by physicians or other health care providers, such as pharmacists. Benefits of telemedicine include increased access to care and increased health care cost efficiency. Current evidence shows that integrating pharmacists into telemedicine clinics for management of chronic health conditions (e.g. diabetes) results in improved patient outcomes. There is a shortage of mental health providers in rural America, including South Dakota. Distance and limited resources complicate access to traditional psychiatric services, such as psychiatrist evaluation, that is more accessible to patients in urban areas. Psychiatrists have been conducting telemental health consultations to distant populations for years, though evidence for team-based psychiatric consult services that include pharmacists is lacking.

The primary purpose of this study is to assess provider acceptance of the implementation of a team-based psychopharmacology consult service for rural clinics. A secondary purpose is to evaluate the type and frequency of interventions made by a team-based psychopharmacology consult service.

The rate of provider action taken with the psychopharmacology consult team’s recommendation will be reported (i.e. accepted, accepted with modifications, or rejected) via retrospective review of clinic records. The type and frequency of interventions will be recorded and analyzed.

The results of this study will be reviewed to potentially expand this service to the entire health system.

Learning Objective:
Identify types of interventions frequently made to the team-based psychopharmacology consult service

ACADEMIC DETAILING TO IMPROVE PRESCRIPTION DRUG MONITORING AND URINE DRUG TEST INQUIRY RATES AMONG LONG-TERM OPIOID USERS. William Bruneau. Beth DeRonne. Elzie Jones. MVAHCS, One Veterans Drive, Minneapolis, MN 55417. William.bruneau@va.gov

Two tools used to assess safety of opioid therapy in patients include the prescription drug monitoring program (PDMP), and a urine drug test (UDT). These two tools can help providers detect diversion, aberrant behaviors, and adherence to prescribed opioid regimens. The Minneapolis Veterans Affairs Health Care System requires prescribers to check a PDMP and UDT at least every 12 months for patients on long-term opioids. In an evaluation of 24 primary care providers with 648 patients on long-term opioids, 72% of patients had a UDT checked in the last 12 months, and 63% had a PDMP checked.

The objective of this project is to determine if pharmacist led intervention visits can improve the rates of UDT and PDMP to comply with Veterans Affairs directives and policies. A secondary objective is to describe the structure and key messages of these intervention visits.

Academic detailing visits will be utilized to provide one on one education and discussion with providers regarding the directives and policies surrounding these two tools. Of the 24 providers previously evaluated, 10 to 15 will be targeted for academic detailing visits. These visits will address perceived barriers to checking UDT and PDMP that providers have, and strategies to improve these rates. After these visits, PDMP and UDT rates will be reevaluated for all 24 providers. The results of this project will further guide academic detailing visits to providers that prescribe opioids.

Learning Objective:
To outline the effectiveness of pharmacist-led academic detailing visits to improve PDMP and UDT inquiry rates among patients on opioids
ASSOCIATION OF PROTON PUMP INHIBITORS AND/OR HISTAMINE RECEPTOR BLOCKERS WITH CLOSTRIDIUM DIFFICILE INFECTION, Rebecca Brust, Fekadu Fullas, James Stratton, Kristel Nelson, Corey Thieman, Kimberly Zellmer, Unitypoint Health St. Luke's Regional Medical Center, 2720 Stone Park Blvd, Sioux City, IA 51104. Rebecca.brust@unitypoint.org.

Clostridium difficile infection is a common cause of nosocomial diarrhea. Complications of C. difficile associated diarrhea (CDAD) can lead to colectomy and even death. Antibiotics have been widely implicated as a risk factor for C. difficile infection, but acid suppression therapy has been identified as a controversial risk factor. Multiple studies have been performed in various settings regarding this potential link with conflicting results.

The purpose of this study is to investigate the relationship between proton pump inhibitors (PPIs), histamine receptor antagonists (H2 blockers), and CDAD in adult patients at UnityPoint Health, St. Luke’s in Sioux City, IA. Patient data will be collected through a retrospective data analysis using the hospital electronic health record. Patients will be separated into case and control groups based on development of CDAD and evaluated for use of H2 blockers, PPIs, and antibiotics. Antibiotics will be included in the analysis to more accurately determine the impact of acid suppression agents.

Results from this study will be used to determine if C. difficile colitis is a potential risk of acid suppression therapy and will potentially lead to new recommendations for use of these agents within our institution.

Learning Objective:
Identify the risk of CDAD due to acid suppression therapy.

RETROSPECTIVE, NESTED CASE-CONTROL STUDY OF THE IMPACT OF IMMUNOSUPPRESSION ON POST-TRANSPLANT MALIGNANCY AMONG ADULT HEART TRANSPLANT PATIENTS Rachel Bubik, Stacy Crow, Ross Dierkhising, 1211 W. Center St., Rochester, MN 55902. Bubik.Rachel@mayo.edu

Post-transplant malignancy develops in approximately 18% of heart transplant patients and is one of the leading causes of death post-transplant. One of the hypothesized modifiable risk factors is the type and amount of immunosuppression a patient receives. Rabbit anti-thymocyte globulin (rATG) is a polyclonal antibody commonly used in transplantation for its profound immunomodulatory activity. Varying dosing strategies of rATG and maintenance immunosuppression are used with unclear effects on malignancy incidence in heart transplant patients.

The primary objective of this study is to identify the relationship between rATG exposure and the development of malignancy in heart transplant patients. The secondary objective is to assess the relationship between maintenance immunosuppression and malignancy development aiming to capture total immunosuppression exposure.

This is a single-center, retrospective chart review of heart transplant patients receiving rATG at a large, academic medical center between January 1, 2001 and December 31, 2015. Patients who developed malignancy will be matched in a 1:2 method based on age, sex, and EBV status to patients whom did not develop malignancy using a nested case-control study design. Odds ratios will be used to measure association between the total immunosuppression exposure and the occurrence of post-transplant malignancy.

The findings of this study will guide how a patient's total immunosuppression exposure influences the risk of developing malignancy after heart transplant and provide insight for tailoring immunosuppression to prevent malignancy.

Learning Objective:
Explain the relationship between overall exposure to induction and maintenance immunosuppression and the development of malignancy in heart transplant patients post-transplant.
Current guidelines suggest that empiric antimicrobial therapy for nosocomial pneumonia be de-escalated to an appropriate pathogen-directed regimen based on culture results and the patient's clinical response. However, there is little evidence available and no recommendations for de-escalation in the setting of nosocomial pneumonia without positive cultures. In clinical practice, these patients are often de-escalated to a fluoroquinolone upon demonstrating clinical improvement.

The purpose of this study is to identify potential predictors of treatment failure following de-escalation to a fluoroquinolone in culture negative nosocomial pneumonia. Cohort entry is defined by inclusion criteria of a diagnosis code of hospital-acquired pneumonia, ventilator-associated pneumonia, or healthcare-associated pneumonia and having received at least 24 hours of fluoroquinolone monotherapy following at least 24 hours of appropriate empiric antibiotics. Positive chest radiography must also be present within 48 hours of receipt of empiric antibiotics. Treatment failure will be defined by a composite of death during index hospitalization, death within 30 days of hospital discharge, readmission for pneumonia within 30 days of discharge, and need for treatment re-escalation during index hospitalization. Secondary outcomes include total and ICU length of stay, 14 and 30 day readmissions, and total duration of antibiotic treatment.

Predictors of treatment failure will be determined by use of Cox proportional regression analysis. Hypothesized predictors include length of empiric therapy, type of pneumonia, patient comorbidities, choice of fluoroquinolone, ICU admission, and multidrug resistant pathogen risk factors.

Results of this study may aid in future identification of candidates most suited for de-escalation of therapy.

Learning Objective:
Identify specific characteristics of patients with nosocomial pneumonia who are at higher risk of failing de-escalation to fluoroquinolone monotherapy.

Cytomegalovirus (CMV) is the most prevalent opportunistic infection in lung transplant recipients, with the incidence of viremia ranging from 30-80%, and contributable morbidity from end organ manifestations such as pneumonia and gastroenteritis. Valganciclovir (VGC) is an oral antiviral prodrug of ganciclovir utilized for CMV prophylaxis in solid organ transplant (SOT) recipients. The incidence of CMV infection and disease are greatest in those subjects with CMV discordance, specifically recipients who are CMV seronegative (R-) who obtain an organ from a patient who is CMV donor positive (D+). In response to literature and a seemingly high rate of CMV resistance at the University of Minnesota Medical Center (UMMC), Fairview, a protocol change for the prophylaxis and management of CMV disease in lung transplant patients was implemented. Key differences include a longer duration of prophylaxis for D+/R- patients, different dose adjustments in renal impairment, and guidance on management of leukopenia.

The objectives are to evaluate the efficacy and safety of the new dosing regimen as recommended by the 2017 protocol change including degree of leukopenia and CMV resistance.

This single-center, retrospective chart review is being conducted in lung transplant patients who were started and dosed on VGC post-transplant according to the previous protocol between 2013 to 2017.

Expected conclusions include the new dosing protocol to result in higher doses, lower rates of leukopenia, and resistance being present within the institution.

Learning Objective:
Recognize the conflicting data surrounding CMV prophylaxis in D+/R- SOT patients.
INCIDENCE OF ACUTE KIDNEY INJURY FOLLOWING TREATMENT WITH VANCOMYCIN PLUS MEROPENEM OR VANCOMYCIN PLUS PIPERACILLIN-TAZOBACTAM AT A TERTIARY CARE HOSPITAL

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Intravenous vancomycin is associated with nephrotoxicity and risk may be increased when combined with other nephrotoxic agents. Recent studies have called into question whether the combination of vancomycin and certain beta-lactam antibiotics leads to increased rates of nephrotoxicity. Piperacillin-tazobactam has been found to be an independent risk factor for nephrotoxicity in critically ill patients. Meropenem has been associated with increased incidence of kidney failure in patients with a creatinine clearance between 10 to 26 mL/min.

The purpose of this study is to determine which regimen, piperacillin-tazobactam plus vancomycin or meropenem plus vancomycin, has higher incidence of acute kidney injury (AKI). This objective will be assessed via retrospective chart review to determine if patients on either combination therapy have experienced AKI as defined by the 2012 Kidney Disease: Improving Global Outcomes (KDIGO) guidelines. Patients will be included if they have received at least 72 hours of concomitant therapy of vancomycin with either piperacillin-tazobactam or meropenem for the treatment of pneumonia between September 1st, 2016 and August 31st, 2017 at University of Missouri Hospital. Baseline serum creatinine must be measured prior to initiation of the antibiotics for a subject to be included. Pregnant patients, patients less than 18 years of age, patients admitted to intensive care units, patients with baseline serum creatinine greater than 2.5 mg/dL, structural kidney disease, post-kidney transplant, AKI on admission, or receiving renal replacement therapy will be excluded.

The results of the study will be used to guide antimicrobial stewardship decisions at University of Missouri Health Care.

Learning Objective:
Identify which antibiotic regimen, vancomycin plus piperacillin-tazobactam or vancomycin plus meropenem, presents a greater risk of patients developing acute kidney injury.

As healthcare continues to evolve, the care that can be provided in the ambulatory setting has become an opportunity for many health systems. TUKHS has seen a significant positive impact on patient care and prescription capture rates with ambulatory pharmacist involvement in specialty clinics, thus justifying the expansion of this model to non-specialty clinics.

The primary objective of this project is to analyze prescription capture rates from the family medicine clinic. An educational intervention during clinic appointments that highlights outpatient pharmacy services will be implemented by utilizing pharmacy and medical students. The family medicine clinic has five fourth-year pharmacy students on rotation year-round who see ~15 patients per day.

This patient population typically has multiple disease states that require multiple non-specialty medications, therefore education of pharmacy services presents a significant financial opportunity. From March 1st, 2017 to May 31st, 2017, of the 15,277 prescriptions generated from the family medicine clinic, only 2,372 (15.5%) were captured by the health system’s outpatient pharmacies. Any increase in this low capture rate is financially significant. Since revenue per non-specialty prescription was ~$90.00 on average (FY18 Q1), only a 5% increase would generate $73,925 in additional revenue per quarter.

Expected results include prescription capture rate overall, prescription capture rate of new patients compared to returning patients, financial impact, time spent per intervention, and recommendations for future generalizability on education of pharmacy services that can be provided across ambulatory clinics.

Learning Objective:
Identify strategies for increasing prescription capture rates in the ambulatory setting
IMPLICATIONS OF CULTURES BEFORE VERSUS AFTER FIRST ANTIMICROBIAL DOSE IN SEPTIC PATIENTS AT AN ACADEMIC MEDICAL CENTER EMERGENCY DEPARTMENT

Vincent Cascone, Rose Cohen, Nicholas Dodson, Chad Cannon. 4000 Cambridge Street Kansas City, KS 66160, vcascone@kumc.edu

Minimizing time to first antimicrobial dose (TFAD) and drawing appropriate cultures prior to starting antimicrobials present conflicting priorities in patients with sepsis. Reducing TFAD improves outcomes, but there is currently a need to better characterize the effects of obtaining cultures after first antimicrobial dose (FAD). Having a better understanding of the implications of FAD prior to culture obtainment will help guide healthcare providers’ practices and may reveal areas for improvement in the care of septic patients.

In this retrospective chart review, we reviewed 247 patients admitted between August 1, 2016 and January 29, 2017 from the emergency department (ED) to an intensive care unit (ICU) with a diagnosis of sepsis, severe sepsis, or septic shock. Patients included received broad spectrum antibiotics and had appropriate cultures collected from sites relevant to the suspected source of infection (e.g. sputum for pneumonia). The primary outcome measure was evaluable cultures from relevant sources (i.e. cultures resulting any organism that is not considered normal flora or contaminant). Secondary outcome measures included the percent of FAD administered at 60 minutes and at 180 minutes from presentation, mean TFAD from presentation (hours), antimicrobial de-escalation and length of therapy, incidence of secondary infections, length of stay at The University of Kansas Hospital (TUKH) (days), and percent in-hospital mortality at 28 days.

We predict that patients with culture obtainment after FAD will have less evaluable cultures, and thus prolonged exposure to broad spectrum antimicrobials, leading to an increase in superinfections and overall worse patient outcomes.

Learning Objective:
Illustrate antimicrobial use patterns relative to appropriate culture timing and identify areas for improvement in management of septic patients.

DEVELOPMENT OF A HEALTH-SYSTEM INPATIENT PHARMACY CLINICAL METRICS DASHBOARD

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A clear method for demonstrating pharmacists’ impact on patient outcomes in real-time and on an institutional-level has yet to be fully developed. The purpose of this project is to develop a process to design an Inpatient Pharmacy Clinical Metrics Dashboard for a health-system. The intent of the dashboard will be to present an automatically generated, real-time report to pharmacy staff of clinical metrics that can demonstrate pharmacists’ impact on patient outcomes. The report will be presented in an easily accessible manner, such as on the Electronic Medical Record (EMR) dashboard.

The primary objective of this project is to describe the process of identifying optimal metrics to include on the dashboard. This will be done through literature review, assessment of practices at other hospitals, meeting with the hospital Quality team, collaboration with the System Pharmacy Clinical User Group (SPCUG), and surveys. The surveys will be distributed to system pharmacy staff, the medication safety team, the pharmacy informatics team, and the quality team. After identification of specific metrics, data points for each metric will be determined and performance goals will be set. For some metrics, medication use evaluations will be carried out to determine current performance before setting appropriate goals.

The results of this project will be used to submit an Information Services request for the dashboard to be built into the EMR. Exemption from Institutional Review Board review has been granted. Phase II of the project will involve the implementation, utilization, and evaluation of the dashboard.

Learning Objective:
List three major stakeholders to incorporate in the development process for an inpatient pharmacy clinical metrics dashboard.
TREATMENT AND OUTCOMES OF ORTHOTOPIC LIVER TRANSPLANT PATIENTS SECONDARY TO HEPATITIS C VIRUS
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Treatment of acute cellular rejection (ACR) in patients with orthotopic liver transplantation (OLT) secondary to hepatitis C virus (HCV) remains a major challenge due to clinicians’ fear of corticosteroids increasing HCV infectivity and reactivity. Direct-acting antiviral agents (DAAs) offer significant advantages over peg-interferon and ribavirin. Sustained virologic response (SVR) is often greater than 90% in treatment-naïve patients with limited durations and improved adverse effect profiles. More patients are achieving SVR before undergoing transplant, yet post-transplant outcomes related to HCV remain unclear. The objective of this study is to characterize post-transplant outcomes of patients who received OLT for HCV-related liver disease and explore potential effect of rejection treatment on HCV recurrence.

This is a retrospective, single-center, descriptive chart review of patients who received OLT for HCV-related liver disease between 2010 and 2016 at a 900-bed, quaternary-care, academic hospital. We described rates of suspected ACR and treatment modalities, recurrence of HCV infection and hepatocellular carcinoma (HCC), and patient and graft outcomes within one year post transplantation.

One hundred and ten patients were included. At the time of transplant, 69 (62.7%) patients had HCV viremia; 52 (75.4%) of them achieved SVR12 post-transplant. DAA regimens were primarily sofosbuvir-based. Suspected ACR occurred in 14 (12.7%) patients, 9 of whom had previously achieved SVR. No recurrence of HCV infection after corticosteroids treatment was reported in patients who had already achieved SVR. Potentially, corticosteroids for treatment of ACR may no longer be a relative contraindication if patients have achieved SVR at the time of rejection.

Learning Objective:
Describe the risk of hepatitis C virus recurrence post orthotopic liver transplantation in patients who have achieved sustained virologic response

SUCROSE-CONTAINING INTRAVENOUS IMMUNOGLOBULIN AND THE INCIDENCE OF RENAL FAILURE IN PATIENTS WITH AT LEAST ONE RISK FACTOR
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Several risk factors have been identified that may predispose patients to acute renal failure when treated with sucrose-containing intravenous immunoglobulin (IVIG). It is recommended that at risk patients, as determined by those risk factors or clinical judgment, should receive IVIG at the minimum dose and infusion rate practicable. The purpose of this study is to determine the incidence of acute renal failure in patients with at least one risk factor, using a sucrose-containing IVIG while utilizing Wesley Healthcare's current processes.

Inclusion criteria are as follows: 18 years of age or older, received one or more doses of IVIG, and have at least one acute renal failure risk factor. Acute renal failure risk factors are defined as diabetes, sepsis, age greater than 65 years old, CrCl less than 50 ml/min, volume depletion, concomitant use of nephrotoxic agents, and paraproteinemia. Patients will be excluded if they received IVIG as an outpatient or there are no baseline or repeat serum creatinine values. Data collection will include pertinent patient characteristics and IVIG dose and infusion information.

The primary outcome is the incidence of acute renal failure in patients who received sucrose-containing IVIG with at least one risk factor. The secondary outcome is the incidence of renal failure in patients with acute renal failure risk factors as stratified by number of risk factors present. Incidence proportion calculation will be used to analyze the primary and secondary outcomes. The results of this study will be used to identify possible improvements to Wesley Healthcare’s current processes.

Learning Objective:
Describe the proposed pathophysiology of sucrose-containing IVIG-induced acute renal failure.
Antipsychotics have been associated with corrected QT (QTc) prolongation, a risk factor in developing of Torsade de Pointes (TdP). Quetiapine, an atypical antipsychotic, has been used off-label for treating intensive care unit (ICU) delirium. In 2010, the American Heart Association (AHA) published recommendations for prevention of TdP in hospital settings.

Primary objectives aimed to evaluate patients with a baseline electrocardiogram (ECG) performed, repeat ECG 8 to 12 hours after quetiapine initiation or dose increase, QTc prolongation incidence, and patients with a baseline QTc > 500 milliseconds (ms) started on quetiapine.

This single-center, retrospective chart review over six months aimed to assess safety and monitoring of quetiapine initiated in critically ill patients using descriptive evaluation. Patients 18 years or older, admitted to an ICU, newly started on quetiapine, and received two or more quetiapine doses were included.

169 ICU patients had quetiapine initiated during admission with 85 patients meeting inclusion criteria. Baseline ECG was performed in 64 patients (75.3%); repeat ECG was performed in 3 patients (3.5%); no QTc prolongation (> 60 ms above baseline) identified; and quetiapine was started in 1 patient (1.2%) with baseline QTc > 500 ms.

The primary objectives to assess safety and monitoring of quetiapine used in treating ICU delirium based on AHA’s recommendations were hindered by the lack of baseline and repeat ECGs, which could have further evaluated QTc prolongation. Scheduled ECG could be one method to improve monitoring, and possibly increase identification of adverse drug reactions.

Learning Objective:
Discuss safety and monitoring methods of quetiapine in critically ill patients according to the 2010 American Heart Association’s published statement with recommendations for “Prevention of Torsades de Pointes in Hospital Settings”
Delirium is characterized by an acute cognitive change from baseline not attributable to pre-existing causes or coma. Hospitalized patients are at an increased risk of developing delirium due to changes in their environment, medications and severity of illness – with an increased risk in intensive care unit (ICU) patients.

ICU delirium caused by hospital-induced risk factors, including circadian rhythm disruption, has been well studied. ICU patients who experience delirium have worsened outcomes including, but not limited to, increased anxiety, length of stay, mortality, and lasting cognitive defects compared to those who never experience delirium. Interventions to promote sleep to maintain patients’ circadian rhythms have yielded positive results, but studies remain scarce.

This study evaluates patient barriers to sleep in the ICU as assessed by ICU nurses. From these results, a sleep hygiene bundle will be developed and assessed for feasibility of implementation amongst a multidisciplinary team. Primary outcomes include identifying perceived barriers and potential interventions to patient sleep hygiene and assessing nursing feasibility for incorporation into workflow.

An electronic survey was developed and distributed to all ICU nurses to collect input regarding patient barriers to sleep, potential interventions and feasibility for implementation. Results were collected for one month then discussed at multidisciplinary team meetings for additional input into bundle development. A sleep bundle will be developed from these discussions and education will be developed around implementation in the ICUs.

From bundle implementation, the goal is to see a decrease in incidence and duration of ICU delirium and its associated negative outcomes.

Learning Objective:
Identify non-pharmacologic interventions to promote patient sleep hygiene in the ICU.
IMPACT OF A PROCALCITONIN LAB BUNDLE ON APPROPRIATE ANTIBIOTIC TREATMENT DECISIONS IN CRITICALLY ILL PATIENTS
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Procalcitonin is a peptide biomarker used to aid in diagnosis of an acute bacterial infection. Since its implementation in 2005, it has been validated for use in both lower respiratory tract infection and sepsis, with different algorithms used based on indication and institution. Timing of this lab is pertinent to its proper use in the critical care setting. Current literature supports more frequent procalcitonin draws in critically ill patients, as often as every 24 hours as opposed to the more traditional 48 or even 72 hour interval. Currently, the ordering process at our institution is inconsistent and often does not reflect standards of practice.

The purpose of this study is to evaluate how a newly created lab series impacts the appropriateness of procalcitonin use in critically ill patients.

A lab series will be embedded into multiple order-sets as well as made available for stand-alone use. Education will be disseminated to the appropriate providers regarding the series with a brief reminder of procalcitonin utility. Chart review will be completed for both pre- and post-implementation groups to evaluate a number of predetermined outcomes. Patients with disease states leading to potentially false positive procalcitonin results will be excluded.

Data will be collected to assess whether the appropriate timing of procalcitonin has increased (primary outcome) and also whether appropriate treatment decisions are being made more often (secondary outcome). Utilization of procalcitonin lab draws will be quantified. APACHE II scores will be calculated to assess for differences in severity of illness between groups.

Learning Objective:
Recall the different time frame procalcitonin should be followed in critically ill patients as opposed to non-critically ill patients.

NEGATIVE PRESURE WOUND THERAPY (NPWT) WITH VANCOMYCIN WOUND INSTILLATION: A SINGLE-CENTER CASE SERIES
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Negative pressure wound therapy (NPWT) consists of applying negative pressure intermittently or continuously to a wound site. More recently, the addition of wound instillation, such as vancomycin, to NPWT has been introduced as a potential method for further improving the wound healing process through decreased bacterial load and improved new tissue formation. However, the clinical impact of adding wound instillation to NPWT is not yet fully understood.

This case series involves a retrospective chart review of patients receiving vancomycin wound instillation with NPWT delivered via the VerfaFlo wound vac system. The study was performed at Sanford Medical Center Fargo, located in Fargo, ND, and involved data pulled from patient charts between the dates of January 1, 2017 to October 1, 2017. Patient demographics, wound characteristics, treatments, length of hospital stay, vitals, markers of infection, and 30-day readmission were collected.

The primary purpose of this case series is to describe the current practice of vancomycin wound instillation with NPWT at Sanford Medical Center Fargo in order to add to the limited body of literature. Secondary descriptions of interest include evidence of healing and safety. Evidence of healing is indicated by improved markers of infection, reduced wound area, and improved wound granulation. As there are no current guidelines for the use of vancomycin wound instillation with NPWT, all safety events are reported to assess continued use of the study regimen.

Learning Objective:
Describe the potential impact of vancomycin wound instillation and current practice at Sanford Medical Center in Fargo.
IMPLEMENTATION OF PHARMACY LED MEDICATION HISTORIES IN A 54-BED HOSPITAL  
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Admission medication history is the process of recording an accurate home medication list when a patient is admitted to the hospital. This time intensive task requires multiple sources of information to obtain correct information. The list is used by physicians to order inpatient medications and to instruct patients on proper medication administration after discharge. Recording an accurate medication list is imperative to preventing medication errors during and after the patient’s hospital stay. Data published has shown a statistically significant improvement in the accuracy of medication lists when they are completed by pharmacy personnel.

Fairview Northland Medical Center is a 54-bed hospital in Minnesota that completes admission medication histories for over 18,000 patients annually. Currently, nurses are completing this task as part of their extensive list of duties when a patient arrives to the hospital. Due to time constraints, errors have been identified on medication lists that have resulted in safety and quality concerns for patients.

The primary study objective is to improve the accuracy of medication lists by using pharmacy residents and students to complete admission medication histories. Baseline data collected prior to program implementation will be used to determine improvement. All patients seen at the hospital through the emergency department, birthplace, surgical department, and inpatient floor will be eligible for analysis.

Learning Objective:
Describe the potential role of pharmacy residents and students in the process of acquiring medication histories.

OUTCOMES OF GRAM-POSITIVE ANTIBIOTIC DE-ESCALATION IN NOSOCOMIAL PNEUMONIA  
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Methicillin-resistant Staphylococcus aureus (MRSA) has been identified as an independent risk factor for mortality in nosocomial pneumonia. Guidelines recommend broad-spectrum empiric therapy, including MRSA coverage. De-escalation to narrower-spectrum agents has been shown to be an effective method of decreasing broad-spectrum antibiotic use in culture-positive nosocomial pneumonia without compromising patient outcomes. However, there is still uncertainty regarding the safety of de-escalation in culture-negative nosocomial pneumonia.

The primary objective of this study is to determine if de-escalation of MRSA coverage in culture-negative nosocomial pneumonia effects 28-day mortality. This will be achieved by comparing mortality rates of patients who had early discontinuation of a MRSA agent to those who did not.

This single-center retrospective cohort study will include all adult patients admitted between January 1, 2012 and December 31, 2016 with an ICD9/10 code for nosocomial pneumonia who had a respiratory culture taken within 24 hours of empiric MRSA coverage. Patients with cystic fibrosis, lung transplant, or patients treated in the bone marrow transplant or oncology units of the hospital will be excluded. De-escalation will be defined as discontinuation of an MRSA agent within four days after the first dose. Secondary outcomes include treatment failure, hospital and intensive care unit length of stay, 30-day readmission for a respiratory diagnosis, time to discontinuation of all antibiotics, and safety of therapy.

Results of this study could help determine if MRSA de-escalation is a safe method for decreasing gram-positive antimicrobial use in culture negative-pneumonia.

Learning Objective:
Discuss outcomes associated with MRSA de-escalation in culture-negative pneumonia.
PREVALENCE OF DIRECTED ANTIBIOTIC THERAPY IN THE ABSENCE OF A FORMAL ANTIBIOTIC TIMEOUT PROCEDURE
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Antibiotic timeouts (ATOs) are an alert mechanism that prompt clinicians to re-evaluate antibiotic therapy intermittently throughout the course of therapy. Limited studies demonstrate that formal ATOs are effective at reducing antibiotic usage and prompting directed antibiotic therapy when applicable.

The primary objective of this study is to evaluate the prevalence of directed therapy in the absence of a formal ATO. Secondary objectives include comparison of directed therapy in the Intensive Care Unit (ICU) versus medical/surgical floors, rates of intravenous (IV) versus oral (PO) administration, rates of documentation of indication within the medication order, and prevalence of informal stewardship interventions.

The data for these objectives were collected through retrospective chart review on the pre-selected date.

Of the 196 patients who received antibiotics in the inpatient setting, 94 (47.96%) received directed, 88 (44.90%) empiric, and 14 (7.14%) prophylactic therapy. Of the 44 ICU patients, 16 (38.10%) received directed, 24 (54.55%) empiric, and 4 (9.10%) prophylactic therapy. Of the 152 medical/surgical patients, 78 (51.32%) received directed, 64 (42.11%) empiric, and 10 (6.58%) prophylactic therapy.

294 antimicrobial orders were reviewed for rates of IV vs PO therapy. 228 (77.55%) were IV and 66 (22.45%) were PO. Documentation of the indication within the medication order occurred in 41 (13.95%) of the 294 agents. Informal stewardship interventions occurred in 91 (46.4%) of the patients enrolled in the study.

These results will be presented to the CoxHealth antimicrobial stewardship committee and used to improve appropriate antimicrobial stewardship.

Learning Objective:
Assess the potential benefits of a formal antibiotic timeout procedure.

COST-EFFECTIVENESS ANALYSIS OF MIDOSTAURIN FOR THE INITIAL TREATMENT OF ACUTE MYELOID LEUKEMIA
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Within the past 30 years, few advances have been made in the initial treatment of acute myeloid leukemia (AML). In April of 2017, midostaurin was FDA approved for the initial treatment of AML in patients with a FLT3 mutation. This agent was approved in combination with cytarabine and daunorubicin (7+3) induction and high-dose cytarabine (HiDAC) consolidation. The addition of midostaurin to standard of care improves overall survival, however, this benefit comes with an increased cost. Based on average wholesale price, standard of care treatment with 7+3 induction followed by HiDAC consolidation is $3,929. With the addition of midostaurin, the cost of induction and consolidation increases to $48,899.

This cost-effectiveness analysis (CEA) was conducted to evaluate the cost versus benefit with midostaurin plus standard of care therapy. The primary outcome will be cost per life-year through the healthcare payer’s perspective. The treatment groups include 7+3 induction followed by HiDAC consolidation with and without midostaurin. A Markov model will be used incorporating health states of active AML, AML in remission, refractory AML, and death. The probability for each health state will be determined by comparing Kaplan Meier curves for overall survival, disease-free survival, and relapse from published literature. Direct medical costs will be estimated through DRG and CPT codes. Sensitivity analyses will also be performed on various components including cost of therapy, efficacy outcomes, and FLT3 mutation rate. This will be one of the first CEAs evaluating midostaurin added on to standard of care induction and consolidation.

Learning Objective:
Identify the benefits of midostaurin when added on to standard of care treatment for patients with AML.
IMPACT OF PHARMACIST-DRIVEN TRANSITIONS OF CARE SERVICES AND A HOSPITAL-DERIVED HIGH-RISK MEDICATION RECONCILIATION SCORE ON UNPLANNED 30-DAY READMISSIONS

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Many hospitals are unable to provide pharmacist-driven transitions of care (TOC) services at all discharges, due to financial, time, and staffing limitations. However, many patients could benefit from TOC services that include discharge medication reconciliation, medication counseling, and medication scheduling, as they can often prevent medication related errors.

Conducted at a regional tertiary care hospital, this single center, retrospective study utilized a hospital-derived high-risk medication reconciliation score to identify patients that are eligible for pharmacist-driven TOC services. The high-risk medication reconciliation score was comprised of three components: 10 or more medications prior to admission; 3 or more high-risk medications; and high healthcare utilization (2 or more inpatient or emergency visits within the past 30 days).

The primary objective of this study was to evaluate the impact of pharmacist-driven TOC services on unplanned 30-day hospital readmission rates among patients with high-risk medication reconciliation scores. Secondary objectives will evaluate each component of the high-risk medication reconciliation score to determine if an association exists between one or more components of the score and hospital readmissions.

Data from patients who received TOC services between November 2017 and January 2018 was compared to data from patients with high-risk medication reconciliation scores who did not receive TOC services at discharge. Descriptive statistics and logistic regression analysis will be used to address study objectives.

Results of the study will be used to improve identification of high-risk patients who will benefit most from pharmacist-driven TOC services.

Learning Objective:
Identify components of a TOC scoring tool that impact identification of patients at increased risk of unplanned 30-day readmissions.

IDENTIFICATION OF VARIABLES ASSOCIATED WITH ACUTE CELLULAR REJECTION IN ADULT HEART TRANSPLANT RECIPIENTS WITH STEROID-ONLY INDUCTION

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Graft failure is one of the leading causes of death among heart transplant (HT) recipients. Induction practices vary widely among transplant centers, and only approximately 50% routinely give induction therapy. While certain variables have been identified that potentially place recipients at higher risk for acute cellular rejection (ACR), such as African American ethnicity, history of ventricular assist device support, and human leukocyte antigen (HLA) mismatching, further study is needed to develop a risk index to predict ACR in this population. The purpose of this study is to identify specific characteristics that place HT recipients who receive steroid-only induction at higher risk for ACR.

This is a retrospective, single-center, cohort study of adult HT recipients who were transplanted between January 2013 and May 2017, and received steroid-only induction. Patient baseline demographics, immunologic and infection history, donor characteristics, post-transplant complications and immunosuppression regimen, and results of all protocol biopsies performed up to 6 months post-transplant were recorded. Expected final results include identification of specific characteristics associated with first ACR episode up to 6 months post-transplant, time to first therapeutic tacrolimus level and percentage of time (days) that tacrolimus levels were within therapeutic range in the first 2 weeks post-transplant, and the incidence of ACR and antibody-mediated rejection (AMR) up to 6 months post-transplant. This data will be used to identify heart recipients at high risk for rejection in order to optimize immunosuppression in this population.

Learning Objective:
Describe risk factors for acute cellular rejection (ACR) in adult heart transplant recipients who receive steroid-only induction therapy.
AN EVALUATION OF LIPOSOMAL BUPIVACAINE AT A COMMUNITY HOSPITAL. Jacob DeCelles, Jennifer McKenna, 20333 W. 151st Street, Olathe, KS, 66061, jacob.decelles@olathehealth.org

Post-surgical pain affects up to 80% of patients. Multimodal pain strategies are utilized in a variety of surgical settings to improve patient care and satisfaction. Liposomal bupivacaine may be included as one step in the management of post-operative pain. This medication is injected locally at the surgical site with sustained pain blocking effects up to 72 hours due to slow release of bupivacaine from the liposomes.

The purpose of this study was to describe current utilization of liposomal bupivacaine as part of post-operative, multimodal pain management at Olathe Medical Center (OMC).

Adult patients who received liposomal bupivacaine between June 2017 and September 2017 were included for analysis. The primary outcome was to determine if intra-operative use of liposomal bupivacaine was consistent with evidence-based literature. Secondary outcomes included pain scores at 24 and 48 hours after surgery, average pain scores up to 72 hours after surgery, length of stay, opioid utilization recorded in morphine equivalents, and opioid medications prescribed at discharge. The intent of the study is to use the results to develop and implement usage criteria.

Learning Objective:
Identify surgical procedures that may benefit from administration of liposomal bupivacaine

RETROSPECTIVE REVIEW OF PROPHYLACTIC VANCOMYCIN FOR CLOSTRIDIUM DIFFICILE INFECTION PREVENTION IN IMMUNOCOMPROMISED PATIENTS. Jacob DeCleene, Jocelyn Mason; University of Minnesota Medical Center – Fairview, Minneapolis, MN; 2450 Riverside Ave, Minneapolis, MN 55454; jdeclee1@fairview.org

Infections due to Clostridium difficile are more prevalent in the transplant patient population compared to the general population. This may occur for a variety of reasons including frequent systemic antibiotic use, administration of immunosuppressive medication and increased hospitalizations. Clostridium difficile infections (CDI) can lead to significant morbidity in the transplant population and complications in the transplanted organ. Treatment for CDI often includes oral (PO) vancomycin and/or metronidazole with newer data emerging in the use of PO vancomycin as prophylaxis against recurrent CDI.

The University of Minnesota Medical Center has a large solid organ and hematopoietic stem cell transplant program and has started to review the use of prophylactic PO vancomycin in this patient population. The current research is a retrospective cohort study evaluating the use of prophylactic PO vancomycin for the prevention of recurrent CDI. The primary objective will be to determine the effect of prophylactic oral vancomycin and the prevention of recurrent CDI in solid organ or bone marrow transplant patients. Secondary objectives include rates of VRE infection and/or colonization, time to recurrence of Clostridium difficile infection and rates of recurrence between different prophylactic PO vancomycin dosing regimens.

The results of this study will be used to determine if prophylactic vancomycin is effective in preventing Clostridium difficile infections and verify if its use is appropriate in this patient population. Results from this study may be used as grounds for initiating a randomized control trial evaluating prophylactic vancomycin in the aforementioned patient population.

Learning Objective:
Compare the rates of Clostridium difficile in the solid organ and stem cell transplant patient population in those who take prophylactic oral vancomycin versus historical controls.
The Veterans Affairs (VA) Hypoglycemia Safety Initiative (HSI) recognizes clinical pharmacy specialists as a resource to decrease the number of patients at risk for hypoglycemia. The HSI uses evidence-based factors to identify patients at increased risk for hypoglycemia. The nationally identified hypoglycemia risk cohort is not currently being widely utilized within our VA Health Care System. The purpose of this project was to identify Veterans at risk for hypoglycemia and evaluate the impact of pharmacy intervention.

This retrospective quality improvement project was conducted from October 17 – December 31, 2017. Veterans were identified using the pre-established risk criteria, which included: a prescription for insulin or a sulfonylurea; HbA1c less than 7 percent; and age greater than 74 years, an ICD-10-CM diagnosis of dementia or cognitive impairment, or serum creatinine greater than 1.7 mg/dL. The hypoglycemia screening clinical reminder was utilized to assess patients in pharmacist medication therapy management telephone clinic, and pharmacists determined the appropriate course of action based on Veterans’ responses. The primary outcomes were the number of pharmacologic and non-pharmacologic interventions. Secondary outcomes included type of pharmacologic or non-pharmacologic intervention, number of Veterans reporting hypoglycemia per the screening clinical reminder, number of Veterans for whom no change to therapy was made, and average time to review and schedule Veterans in clinic and complete the encounter.

Results will be utilized to assess the impact of pharmacy intervention and determine future project expansion into other clinics within the health care system and need for pharmacist education.

Learning Objective:
List the risk components of the hypoglycemia safety initiative risk cohort.

EVALUATION OF RASBURICASE DOSING IN TUMOR LYSIS SYNDROME
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Tumor lysis syndrome (TLS) is a series of metabolic derangements caused by the release of intracellular contents into the blood after the rapid lysis of malignant tumor cells in patients with rapidly proliferating malignancies, such as leukemia and lymphoma. A patient’s risk for developing TLS is classified as low, moderate, or high based on diagnosis, tumor burden, uric acid, and renal function. Current management of TLS includes aggressive hydration, allopurinol, and/or rasburicase. Although rasburicase was FDA approved as a 0.2 mg/kg IV daily dose for up to 5 days, flat doses of rasburicase, including 6 mg and 3 mg, have been used for the prevention and treatment of TLS. While there is literature supporting the use of rasburicase 3 mg for the prevention and treatment of TLS, data are limited in high risk patients.

This retrospective chart review will evaluate the rate of treatment success of rasburicase at 3 mg and 6 mg doses for the prevention and management of TLS. Additionally, institutional prescribing patterns will be evaluated for appropriateness. Secondary outcomes include the rate of appropriate prescribing based on TLS risk and indication, percent reduction of uric acid at 48 hours, percent of patients requiring repeat rasburicase doses, development of renal failure requiring hemodialysis, and assessment for potential cost savings with the utilization of a lower dose.

This study aims to ensure appropriate utilization of rasburicase and evaluate the efficacy of rasburicase 3 mg flat dosing to optimize patient care and potentially decrease cost.

Learning Objective:
Identify the potential benefits of utilizing a rasburicase 3 mg flat dosing strategy for the treatment and prevention of tumor lysis syndrome.
IMPLEMENTATION OF A PHARMACIST-DRIVEN WEIGHT-BASED ANTIBIOTIC PROTOCOL IN THE EMERGENCY DEPARTMENT

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According to the Center for Disease Control and Prevention, more than one-third of the U.S. adults have obesity. Compared to the general population, obese patients are at a greater risk of morbidity and mortality from infections. Obesity alters the pharmacokinetic and pharmacodynamic profiles of antibiotics, which could affect efficacy. Suboptimal dosing regimens of antibiotics may result in treatment failure, hospitalization, promotion of antimicrobial resistance, and increased healthcare cost.

At Fairview Ridges Emergency Department, pharmacists have been documenting the number of clinical interventions made. In a 6-month period, about 26% of dosing recommendations made by pharmacists were about increasing antibiotic doses in obese patients. Obese patients are a relevant population seen in the ED and decreased awareness by clinicians regarding optimal dosing prompted the development and implementation of a pharmacist-driven protocol that is used to identify obese patients and allow for automatic medication dosage adjustments.

The primary objective of this study is to evaluate the implementation of an antibiotic weight-based dosing protocol. A retrospective review will be performed for a 3-month period prior to implementation of the protocol to assess if antibiotics were optimally dosed in patients weighing more than 90 kilogram and receiving intravenous antibiotics. After a 3-month trial of utilizing the protocol, a chart review will be evaluated to analyze compliance of the protocol.

The results of the study will provide support to implement a system-wide protocol with the aim to help increase efficiency during order verification, expand pharmacist scope of practice, and create a standard of care.

Learning Objective:
Discuss the objectives and results of implementing a weight-based antibiotic protocol in the emergency department

UTILIZATION OF A NOVEL DIURETIC PROTOCOL IN THE EMERGENCY DEPARTMENT TO IDENTIFY POTENTIAL HEART FAILURE READMISSION AVOIDANCE

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Heart failure remains one of the most common chronic disease states that places patients at a risk for exacerbations that require hospital admission. The American Heart Association estimates that 50% of patients who are admitted for an exacerbation will be readmitted within the next six months. While current literature describes using diuretics in heart failure clinics and in patient homes, many patients present to the Emergency Department (ED) already in an exacerbation. Literature assessing the effects of using diuretics in patients presenting to the emergency department to prevent an admission is lacking. This study will look at using IV diuretics in the ED to prevent high risk heart failure patients from being admitted for an exacerbation.

The aim of this study will be to determine if an existing protocol, already implemented at DePaul Hospital ED (DPED), could be used in the ED setting to reduce heart failure readmissions. The primary outcome is to show evidence of safety when using a protocol to decrease heart failure admissions This retrospective review will be evaluating the impact of such a protocol compared to a historical cohort.

Study data was retrospectively collected from the electronic medical record before and after the diuretic protocol was implemented in the DPED and collected in an excel spreadsheet. This study is providing evidence for safely preventing admission for heart failure patients utilizing a diuretic protocol. The results could be used to justify the inclusion of a pharmacist-driven diuretic protocol in an outpatient heart failure clinic.

Learning Objective:
Identify specific risk factors that puts heart failure patients at a higher risk of experiencing an exacerbation
PHARMACY DRIVEN ANTIMICROBIAL STEWARDSHIP THROUGH CULTURE REVIEW WITHIN THE EMERGENCY DEPARTMENT  Jennifer Doughty, Betsy Pederson, Brooke Bitner. Stormont Vail Health. 1500 SW 10th Ave, Topeka, KS 66604. jedought@stormontvail.org

Most antimicrobial stewardship programs have largely focused on inpatient hospital encounters. Minimal published data exist for the optimization of antimicrobial use within the emergency department (ED). A recent study suggests the benefit of emergency medicine (EMED) pharmacists performing urine culture reviews in decreasing antimicrobial use for patients with asymptomatic bacteriuria.

We hypothesized that by implementing a pharmacy-driven culture review protocol for all cultures drawn on patients discharged from the ED would optimize antimicrobial selection and decrease unnecessary antibiotic exposure. Additionally, we believed a pharmacy driven culture review protocol would decrease physician workload, decrease unplanned return visits to the ED, and improve patient outcomes.

This was a retrospective cohort study comparing sixty days of data pre- and post-implementation of a physician-approved protocol for ED outpatient culture results. ED charge nurses completed pre-implementation culture review; post-implementation culture review was completed by the EMED pharmacists. Inclusion criteria included any patient discharged from the ED with cultures or lab results still pending. Exclusion criteria included patients withdrawing care, patients admitted to a hospital, and sexually transmitted disease results.

Analysis of the pre-implementation group showed 14% of all positive culture results had inappropriate follow-up provided. The majority (49%) of inappropriate follow-ups were either cultures with no treatment provided or the identified organism was resistant to therapy prescribed. Other areas of inappropriate follow-up include unnecessary treatment of asymptomatic bacteriuria, incorrect dose or duration of therapy, or contraindications for use of therapy selected. Post-implementation results are currently pending.

Learning Objective:
Describe the benefit of utilizing pharmacists to review outpatient ED culture results after patient discharges.

IMPROVING DEXMEDETOMIDINE USE FOR SEDATION IN MECHANICALLY VENTILATED PATIENTS  Lauren Dubosh, Matthew Lillyblad, Christina Askew, Rachel Root, Abbott Northwestern Hospital, 800 E. 28th Street, Minneapolis, MN 55407. lauren.dubosh@allina.com.

Use of dexmedetomidine for sedation in mechanically ventilated patients has increased in recent years, largely due to its beneficial effects in comparison to benzodiazepines and propofol. Several studies have demonstrated respiratory stability, reduced times to extubation, decreased incidences of delirium, and increased patient awakening with the use of dexmedetomidine in comparison to traditional sedatives. While the utility of dexmedetomidine for sedation in mechanically ventilated patients has been validated, adverse effects of hypotension and bradycardia as well as high cost remain significant barriers.

Although intended for short-term use (less than twenty-four hours) at rates of 0.2-0.7 mcg/kg/hour, at our institution dexmedetomidine is often infused at rates higher than 1.5 mcg/kg/hour and for greater than twenty-four hours. Whether infusions of dexmedetomidine at rates greater than 1.5 mcg/kg/hour provide any additional benefit with regard to efficacy of sedation remains unclear.

The purpose of this assessment is to evaluate appropriate use of dexmedetomidine with respect to dose, efficacy and safety of sedation, and financial implications. A retrospective chart review of seventy-five mechanically ventilated patients is being conducted in order to evaluate the impact of infusion rate with respect to achievement of Richmond Agitation Sedation Scale (RASS) goals and hemodynamic stability. We further seek to evaluate its use in combination with other sedatives and proximity of use to extubation.

Results and any recommendations regarding changes in dosing will be shared with intensivists and advanced practice providers with the eventual goal of improving sedation efficacy and safety while decreasing cost.

Learning Objective:
Identify appropriate infusion and titration rates of dexmedetomidine for promotion of effective, safe and cost-conscious sedation in mechanically ventilated patients.
IMPLEMENTATION OF HYPERTENSION MANAGEMENT BY PHARMACISTS WITHIN PATIENT ALIGNED CARE TEAMS AT A VETERANS AFFAIRS HEALTH CARE SYSTEM Alexandra Dugan, Andrew Beckmann, Justin Frazer. Veterans Affairs Nebraska-Western Iowa Health Care System, 4101 Woolworth Ave., Omaha, NE 68105. Alexandra.dugan@va.gov

Among US veterans, hypertension (HTN) is the most common chronic condition. At our institution, pharmacists can independently manage HTN; however, prior to this quality improvement project, only 2.4% of pharmacy encounters were HTN focused. The Primary Care (PC) Almanac is a tool used to examine a nationally standardized collection of reports that ultimately enables the pharmacist to proactively assess chronic conditions and identify patients in need of further management. The objective of this project was to evaluate utilization of the PC Almanac within an Omaha pharmacy Medication Therapy Management (MTM) clinic for identification of patients with uncontrolled HTN and concomitant diabetes (DM).

This quality improvement project was initiated within a single primary care clinic and included review of three providers’ patient panels to identify patients with DM and a blood pressure ≥140/90 mmHg. Subjects meeting this criterion were further examined to determine eligibility and appropriateness for pharmacist directed HTN management. Eligible subjects were scheduled for a face-to-face clinic visit with a pharmacist during a pre-established implementation period, January 1, 2018 through March 1, 2018.

A retrospective analysis of the electronic medical record was conducted to obtain the following data: time required to generate a patient list utilizing the PC Almanac and identify appropriate candidates for MTM management, percentage of patients from the PC Almanac list identified as appropriate candidates for pharmacy MTM management, and percentage of patients reviewed currently enrolled in MTM clinic. The results were utilized to assess functionality of PC Almanac use within an MTM clinic for HTN management.

Learning Objective:
Describe the utility of Primary Care Almanac use by Pharmacists within Patient Aligned Care Teams at a Veterans Affairs Health Care System.

ALTEPLASE 1 MG/1 ML VERSUS 2 MG/2 ML FOR THE CLEARANCE OF THROMBOTICALLY OCCLUDED CENTRAL VENOUS ACCESS DEVICES Angela Dugan, Taylor Gill, Via Christi Hospitals Wichita, Inc., 929 N. St. Francis, Wichita, KS 67214. Angela.dugan@ascension.org

Alteplase is indicated by the Food and Drug Administration for the restoration of function to central venous access devices (CVADs) at doses of 2 mg/2 mL per affected lumen. Because the priming volume of many CVADs is less than or equal to 1 mL, alternative doses of 1 mg/1 mL have been studied, although limited. The purpose of this study is to ensure the appropriateness of an alteplase 1 mg/1 mL institutional autosubstitution for 2 mg/2 mL in the clearance of thrombotically occluded CVADs and to perform a cost analysis comparing the two dosing regimens.

In this Institutional Review Board approved, retrospective chart review study, electronic medical record reports have been used to identify all inpatients who received either alteplase 2 mg/2 mL or 1 mg/1 mL for the clearance of CVADs during a 6 month period before and after the implementation of the autosubstitution respectively.

The primary outcome comparing the two groups on the effectiveness of a single alteplase dose for the clearance of thrombotically occluded lumens of CVADs resulted in no significant difference being found. When analyzing secondary outcomes, the 1 mg/1 mL group was associated with significantly fewer vials dispensed per occluded CVAD and a lower direct medication cost in comparison to the 2 mg/2 mL group. Given these results, it can be concluded that the autosubstitution of alteplase 2 mg/2 mL to 1 mg/1 mL for the clearance of occluded CVADs is appropriate, has similar efficacy and is more cost effective.

Learning Objective:
Recognize the mechanism of action for alteplase in the clearance of thrombotically occluded CVADs
BAR CODE MEDICATION ADMINISTRATION (BCMA) IMPLEMENTATION IN PROCEDURAL AREAS

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BCMA systems improve safety at the point of care by ensuring the “5 rights” for medication administration: patient, drug, dose, route, and time. The use of these systems improves quality and quantity of medication use documentation. While BCMA use in inpatient hospital units is widespread (>30% of hospitals nationwide), it is far less common within procedural areas. Data captured by BCMA helps pharmacy buyers maintain and optimize drug inventories, and for hospitals serving a high percentages of indigent or impoverished patients, utilize the 340B drug purchasing program. Thus, BCMA implementation can improve both patient safety and drug cost savings.

The purpose of this project is to achieve successful implementation of BCMA and objectively measure improvements in patient safety and medication cost savings. This is being achieved through collaboration with members of the anesthesia department, pharmacy informatics team, and 340B program coordinator. Outcomes are being measured using reports designed within Epic’s Reporting Workbench, the reporting interface between barcoding technology and the electronic medication administration record (eMAR). Data collected includes BCMA compliance rates within the operating room (OR), cost savings estimates based on accumulations data in Macro Helix, a 340B program software application, and safety events occurring in the OR before and after the implementation of BCMA. The results of this project will be used to show improvements in patient safety and track medication purchasing cost savings.

Learning Objective:
Identify potential safety benefits associated with use of barcode medication administration (BCMA)

IMPACT OF PROACTIVE REVIEW OF DENIALS IN A HEALTH SYSTEM BASED INFUSION CENTER

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Infusion therapy is an area that allows health systems to capture revenue in the outpatient setting and has projected rapid growth in the coming years. In recent months, The University of Kansas Health System evaluated methods to increase the utilization of the hospital Infusion Therapy Clinic. However, during the analysis it was revealed that there were numerous denied claims creating revenue loss for the health system. Prior to focusing efforts on increasing services, reducing denials is the top priority to enhance revenue. During preliminary analysis, it was determined that the primary issues surrounding denials are related to authorization, uncovered medications, lack of medical necessity, and coordination of benefits. By focusing on these issues and targeting high-dollar medications, the health system can develop a process to decrease the number of denied medications.

Denied infusion therapy clinic claims have added to $11 million each year at The University of Kansas Health System. By proactively reviewing data regarding denials, there is opportunity to regain this loss. A database containing data for the infusion clinic was created to assist with this process. An Infusion Denials Committee has been formed to review this data in order to conduct an analysis of the top three denied infusion therapy medications over a six-month period to evaluate contributing factors for medication-specific denials. A review of denials before and six months after the formation of the Infusion Denials Committee will focus on the financial impact of the team and the annual savings that their efforts entail.

Learning Objective:
Discuss process-improvement initiatives that will allow for a proactive review and workflow to prevent denials
INTEGRATING ANNIE INTO PHARMACY MEDICATION MANAGEMENT CLINICS TO IMPROVE PATIENT SELF MONITORING AND REPORTING Dacey Eggers, Joseph Berendse, William Hayes, VA Black Hills Health Care System, 113 Comanche Road, Fort Meade, SD 57741. Dacey_Eggers2@va.gov

Pharmacists at the VA Black Hills Health Care System (VABHCS) operate a medication management clinic that utilizes patient reported data such as blood sugar or blood pressure measurements. The VA created a mobile health (mHealth) application called ANNIE, that prompts patients to report this health data through text messages. Pharmacists have access to this, which eliminates using appointment time to collect patient data. ANNIE was introduced to VABHCS in 2016.

This project’s focus is to further integrate ANNIE into the medication management clinic. This integration will accomplish two objectives. The first is to increase pharmacist efficiency during medication management appointments. The second is to increase the total number of days per month that patients report information.

To facilitate this integration, access to the ANNIE program was expanded to all pharmacists in the clinic. Pharmacists could enroll any patient in the clinic that they deemed an appropriate candidate. Additionally, the note template used in the clinic was updated to include a reminder of the availability of ANNIE. Pharmacist efficiency was determined using a pre-and-post survey completed by all pharmacists who enrolled patients into ANNIE. It contained questions regarding the effect ANNIE had on time spent collecting patient information. Chart reviews of all patients enrolled in ANNIE were conducted to determine the number of days per month patients reported information.

Results of this project will help determine how best to utilize mHealth applications like ANNIE in the pharmacy medication management clinic.

Learning Objective:
Discuss the pros and cons of using mobile health (mHealth) applications like ANNIE in the VA BHHCS pharmacy medication management clinic.

OLANZAPINE VERSUS FOSAPREPITANT FOR CHEMOTHERAPY-INDUCED NAUSEA AND VOMITING PROPHYLAXIS IN PATIENTS RECEIVING SINGLE-DAY HIGH-DOSE MELPHALAN Ekim Ekinci, James E. Cox, Joe E. Ensor, Edward T. McLean, Carlos Ramos, Premal D. Lulla, Rammurti T. Kamble, George Carrum, Houston Methodist Hospital, 6565 Fannin Street, Houston, TX 77030. eekinci@houstonmethodist.org

Olanzapine is a first-line treatment option for acute and delayed chemotherapy-induced nausea and vomiting (CINV) prevention in patients receiving highly or moderately emetogenic intravenous chemotherapy. While olanzapine’s utility for CINV has been studied in a variety of patient populations, its use in patients receiving conditioning regimens for stem cell transplantation (HSCT) warrants further investigation. At Houston Methodist Hospital, an olanzapine-based CINV prophylaxis protocol consisting of olanzapine, ondansetron, and dexamethasone (OOD) was instituted for multiple myeloma patients receiving single-day high-dose (SDHD) melphalan prior to HSCT. Prior to OOD, a fosaprepitant, ondansetron, and dexamethasone (FOD) protocol was used.

The purpose of this analysis is to compare the efficacy of the OOD and FOD prophylaxis protocols. Primary endpoint is proportion of days requiring rescue CINV medications within seven days (168 hours) of melphalan administration, reported as a percentage out of seven days. Wilcoxon rank-sum test will be used to analyze primary endpoint.

Preliminary analysis included 66 patients [FOD (n=43), OOD (n=23)] with similar baseline characteristics. Proportion of days requiring rescue CINV medications was significantly higher with FOD (71.4% versus 14.3%, p=0.0013). Mean adherence to protocols were similar. Only one patient receiving OOD (4.3%) was switched to FOD due to hypotension thought to be related to olanzapine. Preliminary results show that, compared to a fosaprepitant-based regimen, an olanzapine-based regimen may lead to a statistically significant decrease in the proportion of days on which patients require rescue CINV medications, with good tolerability. Time to engraftment, days of hospitalization, and cost effectiveness analysis are ongoing.

Learning Objective:
Identify olanzapine’s potential role in chemotherapy-induced nausea and vomiting prophylaxis in patients receiving conditioning regimens for hematopoietic stem cell transplantation.
Female Veterans are the fastest growing patient population receiving healthcare through the Veterans Health Administration. The number of female Veterans has nearly doubled since 2000. The majority of female Veterans are in their reproductive years and potentially teratogenic medications pose risks for birth defects and adverse outcomes if pregnancy occurs. These risks range from central nervous system anomalies to low birth weight. Based on specified inclusion and exclusion criteria, a one year retrospective chart review at the Minneapolis VA Health Care System identified 156 potentially teratogenic medications prescribed to women of child bearing age. Of these 156 prescriptions, only 34% had teratogen specific counseling documented from prescriber and/or pharmacist and 28% had no counseling documented at all.

The primary objective of this study is to determine the effect of providing targeted education to prescribers and outpatient pharmacists and electronic system changes on teratogenic medication counseling documentation.

Using the data collected from the retrospective chart review, prescriptions will be grouped by prescriber department. The grouping will identify prescribing trends to help focus targeted education efforts. Targeted education will also be provided to outpatient pharmacists in addition to note template changes in the electronic health record to promote ease of use in documentation. Post targeted education data will be collected and analyzed.

The use of oral antineoplastic medications has risen substantially since the early 2000s. Obtaining oral antineoplastics can be difficult for patients because of the need for prior authorizations, limited distribution networks, and/or high drug costs. Additionally, monitoring adherence and medication side effects has proven difficult for many cancer centers. To address these issues, Mercy Cancer Center created a medication access coordinator (MAC) program to assist patients with specialty medication acquisition as well as help with follow-up monitoring.

The primary objective of this study was to evaluate provider, nurse and patient satisfaction with the MAC pilot program. Time to third party medication approval, adherence to therapy, patient out-of-pocket expenses saved via MAC interventions, as well as additional hospital revenue realized was also studied.

Pre- and post-MAC implementation surveys of providers, nurses, and patients (post- only) was used to collect satisfaction data. The MACs standardly capture: drug(s) prescribed, diagnosis, prescribing physician, time spent on each patient, time to medication approval, and out of pocket medication expenses saved via MAC interventions. Medication compliance and side effect(s) monitoring is assessed through telephone interviews conducted by a MAC who is an LPN.

The addition of a MAC program to our cancer center has been successful. Patient, nursing, and provider satisfaction surveys have been overwhelmingly positive in regard to this new program. The MAC program has greatly facilitated the medication acquisition process, found a great deal of out-of-pocket savings for patients, saved a substantial amount of nursing time, and increased the resources available to our hospital.

**Learning Objective:**
Describe opportunities for improving teratogenic medication counseling and documentation

**Learning Objective:**
Describe the purpose and function of a medication access coordinator program and discuss how a MAC program affects patient care, nursing/provider staff, and hospital resources.
EVALUATION OF HEPATITIS B VACCINE DOSING STRATEGIES UTILIZED IN HUMAN IMMUNODEFICIENCY VIRUS INFECTED ADULTS AT AN ACADEMIC MEDICAL CENTER INFECTIOUS DISEASE CLINIC

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Hepatitis B virus (HBV) vaccination is recommended in all human immunodeficiency virus (HIV)-infected patients due to their risk of HBV infection. It is well established that hepatitis B vaccine seroconversion rates in HIV-infected adults are lower than the seroconversion rates of HIV-negative adults. Current guidelines do not provide a recommendation for the most effective hepatitis B vaccine regimen in HIV-infected patients, but several strategies have been studied.

The primary objective of this study is to assess the seroconversion rates between any hepatitis B dosing strategies utilized at an academic medical center infectious disease (ID) clinic in HIV-infected adults. Secondary objectives will compare seroconversion rates between vaccine strategies based on CD4 cell count and HIV viral load.

This study is a retrospective review of all HIV-infected adults on antiretroviral therapy who were followed by a provider at an academic medical center ID clinic. The data collected will be from patients seen between March 1st, 2017 to October 20th, 2017. Eligible patients must have received at least one dose of hepatitis B vaccine at the ID clinic. Patients will be excluded if they have acute or chronic HBV infection or if the patient did not have a hepatitis B surface antibody assessed after starting the vaccine series. Descriptive statistics will be used to assess patient characteristics and seroconversion rates of the different vaccine dosing strategies.

Results of this study may offer practitioners additional guidance as to which vaccine strategy will provide HIV-infected patients with the highest chance of developing immunogenicity to HBV.

Learning objective
Identify the hepatitis B vaccine dosing strategy with the highest seroconversion rate utilized in HIV-infected adults at an academic medical center ID clinic.

TREATMENT RATES OF ASYMPTOMATIC BACTERIURIA BEFORE AND AFTER IMPLEMENTATION OF A COLLABORATIVE PRACTICE AGREEMENT FOR EMERGENCY DEPARTMENT CULTURE FOLLOW-UP

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Asymptomatic bacteriuria is a commonly over-treated condition in patients who present to the Emergency Department. Current guideline recommendations do not support the use of antibiotics in most patients with asymptomatic bacteriuria. Unnecessary antibiotic use predisposes the patient to adverse drug effects the development of resistant organisms and Clostridium difficile (C. diff) infection, all of which are linked to increased healthcare cost and patient morbidity and mortality.

The purpose of this study is to determine the effect of pharmacist driven antimicrobial stewardship per a collaborative practice agreement on proper treatment of asymptomatic bacteriuria. Secondary purposes are to determine this collaborative practice agreement’s effect on ED re-presentation, hospital admission and development of C. diff infection.

Data for these objectives will be collected by retrospective chart review. Our study will compare a pre-collaborative agreement timeframe and a post-collaborative agreement timeframe.

The results of this study will be used to justify the current protocol for ED culture follow-up and to encourage future development of pharmacy driven collaborative practice agreements.

Learning Objective:
Describe the effect of a collaborative practice agreement that allows emergency department pharmacists more autonomy in urine culture follow-up.
UTILITY OF COMMUNITY PHARMACY STAFF PARTNERING WITH PRESCRIBERS TO IMPROVE STATIN USE IN PATIENTS WITH DIABETES

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Patients with diabetes have an increased risk of comorbidities including atherosclerotic cardiovascular disease (ASCVD). Statins decrease macrovascular complications of diabetes and are recommended for all patients with diabetes per the American Diabetes Association. The Centers for Medicare and Medicaid Services established a quality measure for “statin use in patients with diabetes age 40 to 75 years old” which insurance companies and pharmacies work with patients to improve. Statins are commonly declined by patients and providers, therefore this is a difficult measure to improve both across chain pharmacies and as an individual pharmacist. A better understanding of reasons for declining statin therapy would allow pharmacies to develop programs or education to increase their use. This study will evaluate the utility of a process involving contacting providers to increase statin prescribing rates.

This study is focused on determining the utility of a new process utilized by pharmacy staff to increase the percentage of statin medications prescribed and picked up by this population across all Lewis pharmacies. A secondary outcome is the frequency of each standardized response prescribers indicate for declining statin therapy for their patient.

Data from each pharmacy will be analyzed using descriptive statistics. Results will be used to develop and refine processes to increase statin use. Reasons for declining therapy could also be used to provide education on the importance of statins to patients and providers. The results will help streamline and improve standard processes used at Lewis pharmacies and could be adapted to other quality measures.

Learning Objective:
Identify common reasons for patients and providers to decline statin therapy for patients with diabetes in the study population.

ANALYSIS OF FEBRILE NEUTROPENIA TREATMENT IN BONE MARROW TRANSPLANT PATIENTS AT AVERA MCKENNAHOSPITAL IN ACCORDANCE WITH IDSA GUIDELINES

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Oncology patients undergoing bone marrow transplant procedures are at a high risk of developing serious infections due to their weakened immune systems. One particularly concerning diagnosis in this patient population is that of febrile neutropenia, due to the potential for serious consequences if it is not adequately addressed. Proper antibiotic treatment of this condition is essential towards helping to ensure a quick recovery with minimal complications. In 2010, the Infectious Diseases Society of America (IDSA) released guidelines for the antibiotic treatment of patients with febrile neutropenia. These guidelines provide recommendations for empiric treatment, as well as timeframes and criteria for when therapeutic adjustments need to be made in order to deliver optimal care for patients receiving this diagnosis.

The purpose of this study is to evaluate whether bone marrow transplant patients diagnosed with febrile neutropenia at Avera McKennan Hospital received therapeutic adjustments from their empiric antibiotic regimen in accordance with recommendations set forth in the guidelines published by the Infectious Diseases Society of America.

These objectives will be assessed through retrospective data collection utilizing the electronic medical records system at Avera McKennan Hospital. Descriptive statistics will be calculated and used to illustrate the study’s results.

The outcomes of this research project will be utilized to identify areas for improvement in antibiotic treatment at Avera McKennan and facilitate discussion on ways to continually improve care.

Learning Objective:
Discuss the diagnostic criteria and treatment approaches for patients with febrile neutropenia.
Diabetic patients admitted to inpatient units who are started on steroids typically have blood glucose levels that are difficult to maintain in the target range. This is due to the effects of glucocorticoids on glucose levels. At Allen Hospital, pharmacists are often consulted to dose insulin in diabetic patients through a collaborative practice agreement. Based on previous research that has shown NPH insulin can counteract glucocorticoid-induced hyperglycemia due to its similar pharmacokinetic profile, this project will implement an extension of the current insulin dosing protocol and use NPH insulin to provide better glucose control.

This project has been approved by the Allen College Institutional Review Board. Retrospectively, diabetic patients who were started on steroids during their hospital admission from January 15, 2017 - April 15, 2017 have been identified by the analytics department. This data has been analyzed to determine how well the glucose levels were controlled during the inpatient stay. Prospectively, patients fitting the inclusion criteria from January 15, 2018 – April 15, 2018 will be identified as inpatient clinical pharmacists are consulted to dose their insulin. If the patients are started on a steroid, NPH insulin will be initiated per protocol in addition to their current inpatient insulin regimen to counteract glucocorticoid-induced hyperglycemia. Blood glucose readings will be analyzed for these patients as well.

At the conclusion of the prospective arm, the two treatment groups will be compared to determine whether the addition of NPH insulin to the standard of care regimen provided better glucose control for these patients.

**Learning Objective:**
Recognize the potential role of NPH insulin in type 2 diabetics to maintain blood glucose within a target range during concomitant glucocorticoid therapy.
EVALUATION OF METHODS FOR CALCULATING QTC AND ITS IMPACT ON PHARMACISTS AT A COMMUNITY HOSPITAL
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Bazett’s equation for calculating corrected QT interval is widely used when interpreting electrocardiograms (ECGs). This method has been shown to calculate a falsely prolonged QTc interval in patients with underlying ventricular conduction defects (VCDs) that widen the QRS complex of the ECG. This project aims to determine the impact of utilizing alternate methods for calculating the QTc interval that correct for VCDs.

Two methods, Bogossian’s and Rautaharju’s, will be utilized to calculate QTc interval and compared to Bazett’s method. ECG data will be collected through the electronic health record; subjects with VCDs will be identified by ICD 10 code. QTc interval data calculated using Bogossian’s, Rautaharju’s, and Bazett’s methods will be compared using a current QTc prolongation pharmacy-led policy at Mercy Hospital as a guide. The number of QTc intervals requiring pharmacist intervention per this policy will be compared for the three QTc methods; the QTc intervals will also be compared based on subject’s underlying VCDs. By reducing the number of falsely prolonged QTc intervals calculated, pharmacists can intervene more appropriately on truly prolonged QTc intervals.

Learning Objective:
Describe alternative methods for calculating a corrected QTc and review impact on pharmacist medication intervention.

EFFECTIVENESS OF MINDFULNESS ON REDUCING STRESS AND JOB BURNOUT IN PHARMACISTS AND PHARMACY TECHNICIANS
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Stress has been shown to reduce attention and decision-making skills, as well as diminish effective concentration. In healthcare professionals, stress has been linked to increased medication errors, poor quality of care, and decreased patient satisfaction. Mindfulness is beginning to emerge as an effective care technique that can help lead to stress reduction. There have been multiple studies looking at the impact of meditation and mindfulness in physicians and nurses, but none to date with pharmacy staff. Being at the center of a patient’s medication care, it is essential to study the effects of mindfulness on decreasing stress in pharmacy staff.

The primary objective of this study was to evaluate the effectiveness of mindful meditation on reducing pharmacist and pharmacy technician stress.

This was a prospective study of inpatient pharmacists and pharmacy technicians who were employed at the University of Kansas Health System between January 2018 to March 2018. Each study subject served as their baseline by completing a survey before study initiation. Participants were then asked to download the meditation application, Insight Timer, to their smartphone and were encouraged to use the application daily for at least 5 minutes. Study subjects were then asked to complete the surveys at midpoint at 6 weeks and study completion as well as download their usage data from Insight Timer.

Learning Objective:
Characterize the correlation between mindfulness meditation and stress reduction in pharmacists and pharmacy technicians.
MEDICATION INTERACTIONS WITH ORAL CHEMOTHERAPY AGENTS: A FOCUS ON THE BCR-ABL TYROSINE KINASE INHIBITORS IN PATIENTS WITH CHRONIC MYELOID LEUKEMIA

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BCR-ABL tyrosine kinase inhibitors (TKIs) display a high drug-drug interaction (DDI) potential. However, it is uncertain whether these interactions impact safety or efficacy outcomes.

The primary objective was to determine the percentage of patients with chronic myeloid leukemia (CML) that receive a BCR-ABL TKI with an interacting medication. Secondary objectives evaluated severity of DDIs, impact on toxicity rates, and effect on BCR-ABL transcript milestones. A single center, IRB-approved, retrospective chart review was conducted of patients who received BCR-ABL TKIs and an interacting medication between January 2013 and September 2016 at The University of Kansas Health System.

One-hundred and twenty-seven patients were included in the final analysis, of which, ninety-nine patients were prescribed at least one interacting medication; forty-six interactions were contraindications or would require therapy modification. All patients with a DDI expected to increase BCR-ABL serum concentrations experienced toxicity compared to 50% of patients who were not prescribed an interacting medication. There was no difference in achievement of BCR-ABL response milestones when comparing patients with DDIs expected to decrease (77.8%) or increase serum concentrations (50%) with no identified interaction (57.1%), P = 0.262.

DDIs continue to be important considerations in CML, as nearly 80% of individuals were prescribed medications that interacted with BCR-ABL TKI therapy. The higher rate of toxicity in patients prescribed interacting medications suggests these DDIs are clinically relevant. DDIs did not impact BCR-ABL transcript milestones, implying there may be more concern with safety rather than efficacy outcomes. Prospective studies are needed to confirm these findings.

Learning Objective:
Characterize the pharmacodynamic impact of drug-drug interactions in patients utilizing BCR-ABL tyrosine kinase inhibitors for chronic myeloid leukemia

PERCEPTION OF CURRENT AND POTENTIAL PHARMACY SERVICES PROVIDED IN AN OUTPATIENT CLINIC SETTING WITHIN A NOT-FOR PROFIT REGIONAL HEALTH SYSTEM

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The Association of American Medical Colleges estimates that by 2030 there could be a shortage of over 100,000 physicians in the United States and over 40,000 physicians in the primary care setting. Furthermore, the Centers for Medicare and Medicaid Services (CMS) payment model and requirements for value-based care have been in flux.

The objective of this study is to identify potential areas of expansion for pharmacy services in an outpatient senior health clinic where pharmacy presence is already established through the responses to a survey questionnaire administered to various levels of administrators and personnel involved in clinic operations.

The survey will contain both Likert scale questions and free response questions that will be distributed to select physicians, office clinic managers, and health system and Medicare insurance administrators involved in the health system’s Senior Health Center. This primary health center serves patients aged 65 and older, and the primary payer is Medicare. Survey responders will be de-identified, and their responses to the survey will be categorized by subject or theme. Descriptive statistics will be used to report Likert scale responses. Categorized responses will be evaluated for feasible opportunities for additional pharmacy service expansion based on, but not limited to, pharmacist availability, current work flow, and financial practicality.

The results of the study will be used to modify and improve or initiate clinical services in the senior health clinic and other potential clinics across the health system.

Learning Objective:
Describe potential new pharmacy services to benefit senior patients in outpatient clinics as determined by responses to a survey questionnaire
EFFECT OF INTRAVENOUS ALBUMIN AND LOOP DIURETIC THERAPY ON DURATION OF MECHANICAL VENTILATION
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Hypoproteinemia is common among critically ill patients and has been associated with the development of acute lung injury (ALI), acute respiratory distress syndrome (ARDS), and subsequent worse clinical outcomes. In mechanically ventilated (MV) hypoproteinemic patients, there are theoretical benefits to albumin and loop diuretic administration that may improve lung physiology. These include an increased fraction of loop diuretic reaching its site of action in the kidney promoting diuresis, and restoration of the colloid osmotic pressure gradient in the lung vasculature reducing pulmonary edema.

Overall, albumin administration does not appear to improve diuresis when administered with loop diuretics; however, two small, randomized controlled trials found that albumin and furosemide therapy increased PaO₂/FiO₂ and net fluid loss compared to furosemide and placebo in patients with ALI. While these findings are interesting, PaO₂/FiO₂ in patients with ALI is a surrogate endpoint that may not lead to improvements in clinically important endpoints. The goal of this study is to determine whether there is an association between albumin and loop diuretic administration and duration of MV in hypoproteinemic patients.

This retrospective analysis will identify hypoproteinemic, mechanically ventilated patients who received albumin and a loop diuretic, versus a loop diuretic alone. The primary outcome will be duration of MV. Secondary outcomes will include a subgroup analysis to determine if albumin administration may be beneficial in any subpopulations of patients. Investigators will use descriptive statistics to describe the outcomes of interest. Study results will help guide future recommendations for albumin use in hypoproteinemic mechanically ventilated patients.

Learning Objective:
Describe the association between IV albumin and loop diuretic administration and duration of mechanical ventilation in hypoproteinemic patients compared to patients who receive loop diuretic alone.

EXPANDING ANTICOAGULATION PATIENT EDUCATION IN AN ACADEMIC MEDICAL CENTER Sarah Fritz; Annie Ungerman; Lauren Mishler; Tony Huke. Truman Medical Centers, 2301 Holmes Street, Kansas City, MO 64108. sarah.fritz@tmcmed.org

Anticoagulation medications are high-risk medications due to their risk for major bleeding. The Centers for Medicare and Medicaid Services and The Joint Commission have recommended educating every patient discharged with a prescription for warfarin; however, those recommendations are expanding to include every patient prescribed any anticoagulant upon discharge from the hospital. New anticoagulation medications have been developed in recent years and are being more widely prescribed. The new anticoagulants reduce the challenges associated with warfarin, such as diet considerations and INR monitoring, however, the safety concerns with anticoagulation remain.

The purpose of this study is to expand the current anticoagulation patient education process to include the newer anticoagulation medications such as apixaban, dabigatran, edoxaban, and rivaroxaban, and to increase the number of patients educated on anticoagulation medications they are prescribed.

The primary end point includes the percentage of patients educated on their anticoagulant prescribed prior to discharge to continue as an outpatient. Secondary endpoints will include the percentage of patients prescribed and educated on each anticoagulant separately. A Chi-square test will be used to analyze nominal data. Mean, standard deviation, and percentage reporting will help define study outcomes.

The results of this study will be used to expand Truman Medical Centers’ anticoagulation patient education process and percentage of patients educated. Consequently, patient safety and adherence should improve.

Learning Objective:
Expand anticoagulation patient education process and percentage of patients educated
EFFECT OF INTRAPLEURAL ALTEPLASE AND DORNASE ALFA ON SURGICAL DECORTICATION RATES IN PLEURAL INFECTIONS Allisha Gabriel, Katherine Hall, Amber Meister, 550 N Hillside Street, Wichita, KS, 67214. allisha.gabriel@wesleymc.com

The use of alteplase and dornase alfa in an attempt to prevent need for surgical intervention in pleural infections is becoming more common. However, few studies have evaluated fibrinolytics and dornase alfa together in this setting. Currently data on initiation of therapy, dosing regimens, length of therapy, and outcomes is limited. The purpose of this study is to evaluate use of intrapleural alteplase and dornase alfa and the percentage of patients undergoing surgical intervention in a real world setting.

Patients admitted with a pleural infection requiring fluid drainage who received at least one dose of both intrapleural alteplase and dornase alfa will be included. A sample size of 68 patients was calculated. Data collection includes dosing regimen (once vs twice daily), total number of doses, time of initiation of therapy, surgical decortication, need for an additional chest tube, length of stay, demographics, admitting diagnosis, cultures of fluid drained, comorbidities, and any adverse medication reactions reported.

The primary outcome is the percentage of patients requiring surgical decortication after at least one dose of intrapleural alteplase and dornase alfa. Secondary outcomes include number of doses, need for an additional chest tube, length of stay, size of chest tube, and adverse medication reactions. Chi-squared tests and descriptive statistics will be used to analyze data. The real world results will be compared to results from a previous study that found 4% of patients required surgical decortication after administering intrapleural alteplase and dornase alfa twice a day.

Learning Objective:
Review literature assessing the use of intrapleural alteplase and dornase alfa and the effects on surgical decortication rates in pleural infections.

CLINICAL COMPARISON OF POLYMERASE CHAIN REACTION VERSUS ENZYME IMMUNOASSAY IN TREATMENT OF CLOSTRIDIUM DIFFICILE ASSOCIATED DIARRHEA Kaylie Gabur, Aileen Ahiskali, Hennepin County Medical Center 701 Park Ave Minneapolis, MN 55415. Kaylie.gabur@hcmed.org

Polymerase chain reaction (PCR) testing is widely known for improved sensitivity versus enzyme immunoassay (EIA) testing. Due to this, PCR testing has become the preferred testing method for diagnosing Clostridium difficile (CD) infection. PCR is able to rapidly detect toxigenic CD strains via amplifying genes encoding for the major virulence factors of CD, toxins A and B. PCR results are obtained within hours, much sooner than EIA results. However, there is debate among professionals if PCR tests are overly sensitive and result in increased rates of diagnosis and treatment of CD.

The primary objective of this study is to determine if there was an increase in treatment of CD infection after transitioning from EIA to PCR testing methods. This is a retrospective chart-review study including adult patients at a single medical center who were tested for CD infection during hospitalization. A total of approximately 150 patients were reviewed: 75 from each the EIA and PCR groups. Exclusion criteria included CD testing completed at an outside hospital, antibiotic treatment for CD infection in the 5 days prior to collection of sample, and treatment with metronidazole for a different indication within two weeks of sample collection.

The hypothesis of this study is PCR testing does not result in increased rates of CD treatment compared to EIA testing. CD infection is a syndrome in which patients should meet criteria for clinical diagnosis and laboratory testing is not intended to be the sole tool in diagnosis and treatment of CD infection.

Learning Objective:
Identify if there was an increase in treatment of clostridium difficile infection after transitioning from EIA to PCR testing in an academic medical center.
EFFECTIVENESS OF 4 FACTOR PROTHROMBIN COMPLEX CONCENTRATE AND VITAMIN K VERSUS STANDARD THERAPY OF FRESH FROZEN PLASMA AND VITAMIN K IN VITAMIN K ANTAGONIST ASSOCIATED INTRACEREBRAL HEMORRHAGE Krutina Garcia, Niaz Deyhim, Jonathan Balk, A. Carmine Colavecchia, John Volpi, Shyam Panchal, Sean Barber, Valerie Belden, Houston Methodist Hospital, 6565 Fannin St. DB1-09, Houston, TX 77030. kgarcia@houstonmethodist.org

Warfarin is a commonly prescribed anticoagulant in the United States. Increased utilization of anticoagulants has led to an increased incidence of intracerebral hemorrhage (ICH), which is associated with mortality rates of 40 to 60 percent. Agents administered for reversal of warfarin associated ICH include fresh frozen plasma (FFP), 4 factor prothrombin complex concentrate (4PCC), and vitamin K. The slow onset of vitamin K necessitates the usage of FFP or 4PCC. Limited evidence exists comparing the clinical outcomes of vitamin K and FFP versus vitamin K and 4PCC in warfarin associated ICH.

The primary objective is to evaluate the change in hematoma volume expansion and clinical effectiveness for patients exposed to FFP versus 4PCC. These objectives will be assessed through a retrospective, multicenter, cohort study in patients with warfarin associated ICH from January 2013 to September 2017 at Houston Methodist. Notable exclusion criteria includes traumatic brain injury, brain death upon admission, and administration of other factor concentrates.

Assessment of inclusion and exclusion criteria has resulted in a total population of 29 patients: 14 FFP patients and 15 4PCC patients. Descriptive statistics will be performed to describe patient baseline characteristics and secondary endpoints. Linear regression analysis will used to assess the change in hematoma volume expansion. The results of this study will be shared with neurology and pharmacy departments to optimize the use of 4PCC and FFP in patients with warfarin associated ICH.

Learning Objective:
Identify the products that are utilized to manage a vitamin K antagonist associated intracerebral hemorrhage

IMPACT OF ROUNDING UP SERUM CREATININE ON VANCOMYCIN TROUGH LEVELS OBTAINED FROM CREATININE CLEARANCE BASED PROTOCOLS IN THE EARLY- VERSUS LATE-ELDERLY PATIENTS Caleb M. Gibson, Daniel L. Hansen, Mercy Hospital, 1235 East Cherokee St., Springfield, MO. 65804. caleb.gibson@mercy.net

Determining an empiric vancomycin dosing interval using the Cockcroft – Gault creatinine clearance (CrCl) equation is widely accepted. Since elderly may have reduced CrCl from many factors, common practice is to round up serum creatinine (Scr) in the CrCl calculation in elderly patients with Scr less than 1 mg/dL. However, this may lead to underestimation of CrCl in patients 65-74 years old, now called “early elderly”, who are still fit and physically active.

The purpose of this study is to determine the effect on vancomycin levels obtained in the early- versus late-elderly population from rounding Scr up to 1 mg/dL with an emphasis on patients for which rounding resulted in using an extended dosing interval per our facility protocol. A secondary purpose is to determine the rates of therapeutic vancomycin trough levels obtained using every 12 versus 24 hour dosing intervals between study groups. Patients meeting study criteria will be randomized, reviewed, and included until 60 patients are achieved in each primary outcome group based on a power analysis showing 116 total patients needed to detect a 25% difference in target trough level achievement between groups (80% power, alpha 0.05).

Data points collected will include age, Scr, actual CrCl, adjusted CrCl with rounding, weight (actual and adjusted), vancomycin doses, dosing intervals, and trough concentrations. T-test analysis and chi-square analysis will be conducted to compare groups.

The results of this study will be used to implement changes in the Mercy Hospital – Springfield vancomycin dosing protocol to improve patient care and treatment success.

Learning Objective:
To review if the current practice of rounding serum creatinine in the elderly population to a pre-determined value based on age alone allows for proper patient care.
THE IMPACT OF ANTIMICROBIAL STEWARDSHIP INTERVENTIONS ON APPROPRIATENESS OF ANTIBIOTICS AT DISCHARGE

Kenneth Gorsegner, Mary Ullman, Pamala A. Pawloski, Sarah Rebecca Peglow, Regions Hospital, 640 Jackson St, Saint Paul, MN 55101. Kenneth.a.gorsegner@healthpartners.com

Following management of the acute infection, medically stable patients can usually be transitioned to oral antibiotics. Ensuring the patient receives the appropriate dose, schedule, and duration of treatment, is integral in safely managing infections during the transition from hospital to home. The need for antimicrobial stewardship during patient discharge is crucial for ensuring infections are managed with best care practice.

The purpose of this study is to evaluate the need for and benefit of antimicrobial stewardship during the transition from the inpatient to the outpatient setting at a level 1 trauma center. We conducted a retrospective analysis of the appropriateness of antibiotics at discharge during a six week period in 2017 compared with a similar six week period in 2018. An analysis of medication reconciliation interventions during the 2018 study period will be conducted.

The results of the study will inform the antimicrobial stewardship program for patient care improvement in the inpatient and outpatient settings.

Learning Objective:
Identify common infectious disease diagnoses that are more likely to be associated with inappropriate antimicrobial prescribing.

Surgical site infections and complications increase hospital length of stay, length of ICU stay, rate of readmission, cost, and the likelihood of death. In certain pediatric trauma cases, best practice guidelines specify a time-to-administration of antibiotics in an effort to decrease the risk of surgical site infections. At our facility, when these times were not being consistently met, trauma providers requested the emergency department (ED) pharmacist’s assistance in finding a solution. The ED pharmacist developed a standardized approach to cefazolin dosing.

The purpose of this study is to evaluate the effectiveness of a pharmacist-led intervention which standardized the dosing of cefazolin in the pediatric trauma population by determining the time-to-administration of cefazolin prior to and following the intervention and comparing these times-to-administration.

This was assessed through retrospective chart review of patients meeting specific inclusion criteria to determine the time-to-administration of cefazolin after admission to the ED. Descriptive statistics were calculated and a Student’s t test was utilized to compare the pre- and post-intervention data. The mean time-to-administration was 2.432±1.359 hours (n=18, CI: 95%) and 0.431±0.180 hours (n=17, CI: 95%), in the pre- and post-intervention groups, respectively. The difference in the means of the two groups is statistically significant, with a t value of 3.670, a t-critical value of 2.045 and p value 0.0005, indicating the intervention made a significant impact on the time-to-administration of cefazolin.

The results of this study will be used to evaluate facility compliance with best-practice guidelines and to implement further changes to improve patient care.

Learning Objective:
Describe the impact that a pharmacist-led intervention made on the time-to-administration of cefazolin for pediatric trauma cases.
ASSOCIATION BETWEEN INTRAVENOUS IMMUNE GLOBULIN DOSING WEIGHT STRATEGIES AND MORTALITY IN HOSPITALIZED PATIENTS: A MULTICENTER STUDY  
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Intravenous immune globulin being a costly product presents a substantial drug spend amount for medical institutions. Traditionally, clinicians have utilized immune globulin based on a patient's actual weight. Published literature to-date addressing ideal body weight dosing strategies have been inconclusive and void of vital details related to clinical outcomes. However, assessing a change from actual body weight dosing to ideal body weight dosing presents a possible cost savings strategy with a 20% reduction in amount of immune globulin seen in previous studies. At Sanford Medical Center, we have changed our dosing model for the Sanford Health System to utilize ideal body weight dosing of immune globulin, but we have not evaluated its impact on clinical outcomes.

The purpose of this study is to determine if a significant difference in hospital mortality and other morbidities is present when comparing an actual body weight-dosing period to an ideal body weight-dosing period after implementation across multiple Sanford hospital sites. Other secondary analyses include clinically significant differences in length of hospital stay, theoretical grams averted and 30-day readmission.

This was a retrospective, sequential period analysis. We conducted parametric patient demographic analysis via the chi-square method, and utilized the Wilcoxon/Kruskal Wallis and students t-test on the non-parametric outcomes data.

The results of the study will provide objective data for outcomes after a health-system-wide change to ideal body weight dosing for immune globulin.

Learning Objective:
Assess the current knowledge of weight-based dosing of intravenous immune globulin, evaluate outcome data, and discuss potential impact in current pharmacy practice.

A RETROSPECTIVE REVIEW COMPARING TEAM-BASED CARE TO USUAL CARE FOR A1C LOWERING OVER 12 MONTHS  
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Value-based care has placed increased emphasis on A1c less than 8% as a quality measure in patients with diabetes. As a result, a pharmacist driven diabetes collaborative practice agreement was created at our institution. We hypothesize that A1C will be lowered more extensively in a team-based care group compared to a usual care group.

The purpose of this study is to compare the effects of team-based care to usual care in lowering A1C over a 1 year period. Patients with an A1c of ≥ 8% will be enrolled from June 1, 2016 to June 1, 2017. The team-based care group must have at least three contacts with a pharmacist during the study period. All other patients will be in the usual care group. The percentage of patients able to achieve A1c less than 8% within 12 months will be compared between groups as the primary endpoint. Secondary endpoints include time to A1c less than 8% in days and the prevalence of hospitalizations/ED visits for hyper- or hypoglycemia.

A Student’s t-test or Mann Whitney U test will be used to compare continuous endpoints. Chi Square or Fisher’s Exact test will be used to compare categorical endpoints. Multivariate regression will be utilized to determine predictive variables for the primary endpoint.

The results of this study will be used to understand the impact of the pharmacist in team-based care for diabetes management.

Learning Objective:
Explain the impact of a pharmacist in team-based care for the management of diabetes related outcomes.
ORDER SET UPDATE TO PROMOTE WEIGHT-BASED INSULIN DOSING FOR TREATMENT OF HYPERKALEMIA IN THE EMERGENCY DEPARTMENT  Laura Halsey, Emily Medcraft, Tamara Bezdicek, 6401 France Ave LL-18, Edina, MN 55435. Lhalsey1@fairview.org

Hyperkalemia is a life-threatening condition that requires emergent intervention to prevent cardiac conduction abnormalities and arrhythmias. In emergent cases, intravenous insulin is preferred over other potassium-lowering agents due to its rapid reduction of potassium levels and ease of administration. Naturally, insulin’s potassium-lowering effect is accompanied by a parallel drop in blood glucose which must be attenuated with concomitant administration of intravenous dextrose. Patient-specific insulin doses, co-medications, and monitoring are important for minimizing risk while ensuring normalization of serum potassium levels.

At Fairview hospitals, the ED Hyperkalemia order set was modified to address this risk. In the absence of evidence supporting traditional 10 unit insulin dosing, this update included a more conservative, weight-based insulin dosing strategy. Additionally, default pre-sets for insulin, dextrose, and monitoring parameters were added to facilitate adequate treatment and early recognition of insulin’s hypoglycemic effects.

The current study is a retrospective, pre and post-implementation review of adults treated with insulin for hyperkalemia at Fairview Hospitals. Patients who received intravenous insulin for the treatment of hyperkalemia between March 1, 2016 and October 31, 2017 were included in the analysis. The primary objective of this study is to identify the change in potassium-lowering effect of two dosing methods of insulin for treatment of hyperkalemia. Secondary objectives include assessing frequency of hypoglycemia, adherence to order set co-medications, and frequency of POCT blood glucose checks. The results of the study will be used to identify a need for further order set review and/or order set education for Fairview team members.

Learning Objective:
Describe the effects of two insulin dosing strategies for treatment of hyperkalemia in the Emergency Department

IMPACT OF BIVALIRUDIN VERSUS HEPARIN FOR PATIENTS WITH LEFT VENTRICULAR ASSIST DEVICE (LVAD) THROMBOSIS Megan Hansen, Heidi Brink, Greg Peitz. Nebraska Medicine, 981090 Nebraska Medical Center, Omaha, NE 68198. meghansen@nebraskamed.com

A variety of strategies for LVAD pump thrombosis are utilized including heparin, direct thrombin inhibitors, thrombolytic agents, pump exchange, and urgent transplantation. Direct thrombin inhibitors, including bivalirudin, have been used in some treatment algorithms when patients have persistent symptoms despite increasing conventional anticoagulation or antiplatelet therapy, but there is a paucity of data with the strategy. A theoretical benefit of direct thrombin inhibitors is their ability to inhibit both free and clot-bound thrombin compared to heparin which binds to free thrombin. The objective of the study is to evaluate the use of bivalirudin compared to heparin for the treatment of LVAD thrombosis and assess the impact on outcomes. The study design is a retrospective cohort chart review conducted on patients with evidence of confirmed or suspected LVAD thrombosis who received bivalirudin or heparin for thrombus treatment.

The primary outcome is the incidence of achieving 50 percent reduction in lactate dehydrogenase or a lactate dehydrogenase of < 500 U/L. Secondary outcomes include the time to therapeutic partial thromboplastin time (PTT), time within PTT goal, time to normalization of pump parameters, incidence of LVAD exchange, cost of drug therapy, intensive care unit and hospital lengths of stay, percent of patients able to transition to oral anticoagulation, and risk factors associated with the development of LVAD thrombosis.

The results of the study will be used to evaluate current LVAD thrombosis anticoagulation practices at Nebraska Medicine.

Learning Objective:
Describe clinical outcomes associated with bivalirudin and heparin for the treatment of LVAD thrombosis.
IMPACT OF A PHARMACIST-RUN NEW PATIENT MEDICATION APPOINTMENT AT A VETERANS AFFAIRS COMMUNITY-BASED OUTPATIENT CLINIC Margit Hansing, Krista Sarvis, Sarah Ahrndt, VABHHCS, 113 Comanche Road, Fort Meade, SD 57741. Margit.Hansing@va.gov

Each year approximately 1.5 million adverse drug events (ADEs) caused by medication errors occur, costing billions of dollars. Medication reconciliation is important during the transitions of care process because it gives health care professionals the opportunity to collaborate and promote positive patient outcomes. Pharmacists can perform medication reconciliation efficiently, effectively, and consistently. VA facilities across the nation have implemented pharmacist-led medication reconciliation appointments for new patients with promising outcomes. Examples of benefits include: saved appointment time for providers, increased identification of medication-related problems, and improved provider-patient relationships. At VA Black Hills Health Care System (VABHHCS), there are currently 50-60 new patient requests weekly, each of which requires provider-led medication reconciliation. These Veterans, as well as the entire provider team, could benefit greatly from this approach to patient safety.

The purpose of this quality improvement project is to evaluate the impact of a pharmacist-led medication reconciliation appointment on the efficiency and quality of primary care appointments for new patients to VABHHCS. Secondary objectives are to assess time saved for the provider, association between the number of medications each new patient is taking and the number of pharmacist interventions, and provider and patient perception of the clinic.

Retrospective chart reviews, PharmD Tool tracking, and new patient clinic questionnaires will be used to assess effectiveness of project interventions.

The results of the study will be used to implement a new patient medication appointment available to all primary care providers within VABHHCS to improve patient care and save time for primary care providers.

Learning Objective:
Describe the impact of a medication appointment on the efficiency and quality of primary care appointments for new patients to VABHHCS

IMPACT OF IN-HOSPITAL TRANSITIONS OF CARE ON SECOND DOSE ANTIBIOTIC DELAY AMONG SEPSIS PATIENTS Elisabeth A. Hanson, David J. Sperl, Irina V. Haller, Colleen M. Renier, 407 East Third Street, Duluth, MN 55805. Elisabeth.Hanson@EssentiaHealth.org

The 2016 Surviving Sepsis Guidelines recommend the administration of intravenous antimicrobials within one hour of identifying sepsis or septic shock. While prompt administration of the first dose of empiric antibiotic(s) is a well-established goal in sepsis care, recent research suggests that delayed second dose administration, specifically within the context of transitions of care, is associated with increased mortality. The objective of this study is to quantify major second dose antibiotic delay among sepsis patients at a single-center institution, and subsequently assess major second dose delay among patients who underwent in-hospital transitions of care.

This study was a retrospective review of electronic health records of adult sepsis patients from a single-center 380-bed hospital, admitted between October 2016 and September 2017. Major second dose antibiotic delay was defined as a difference between the charted start time of first and second antibiotic doses ≥ 125 percent of the prescribed dosing interval. The time difference between first and second antibiotic doses will be analyzed and the fixed percentage of second doses administered with major delay will be reported. The effect of in-hospital transitions of care between doses will be evaluated using 2 x 2 comparisons reporting odds ratios and confidence intervals.

The results of the current study will help to assess if second dose antibiotic delay is common among sepsis patients undergoing transitions of care. In addition, the findings will be used to identify quality improvement opportunities to impact inpatient sepsis care delivery and patient outcomes in this population.

Learning Objective:
Describe the impact of in-hospital transitions of care on delayed second dose antibiotic administration for sepsis patients.
Patients who refuse blood products due to religious beliefs pose a unique challenge when trying to address coagulopathies and acute blood loss during cardiac surgery. Given the potential complications from cardiac surgery such as intraoperative bleeding and coagulation deficiencies, this subset of patients is at risk for increased morbidity and mortality due to acute blood loss. The use of human 4-factor prothrombin complex concentrate (4PCC) to correct coagulation related disorders provides an alternative to the use of allogeneic blood products in patients undergoing cardiac surgery. At present, several studies have evaluated the outcomes of patients who refuse blood products based on religious beliefs, but little evidence has assessed the use of 4PCC in this population who undergo cardiac surgery.

The purpose of this retrospective, cohort study is to observe the mean change from baseline to nadir hemoglobin seven days post-op. Secondary outcomes include the incidence of thromboembolic complications within 30 days of initial procedure in patients who received 4PCC. Secondary endpoints also include the incidence of post-op atrial fibrillation, acute kidney injury, and incidence of post-op mortality within 30 days of initial surgery.

Propensity score adjustment will be used to control for the selection biases in observational research to evaluate comparative effectiveness and safety of patients who receive 4PCC versus those who do not. Comparisons between groups will be done using Fisher’s exact test and Mann-Whitney U test.

The findings of this study will assist in determining the utility of 4PCC to minimize acute blood loss in Jehovah’s Witness patients.

Learning Objective:
Investigate the safety and efficacy of prothrombin complex concentrate among patients undergoing major cardiac surgery that refuse allogeneic blood products.

Asthma is a costly condition that affects nearly 26 million Americans. In 2010, approximately 1.8 million emergency room visits were attributed to asthma. Specifically, Medicaid recipients have shown increased utilization of the emergency room compared to privately paying individuals due to risk factors such as: no post-discharge follow-up visit, mental illness, non-adherence, unstable living environments, and/or substance abuse.

Objectives of this study are to demonstrate the impact of pharmacist intervention on patients’ knowledge of their asthma and medications; describe the number/type of drug-related problems identified by pharmacists; and report the process of drug regimen reviews conducted by community pharmacists for the identified patients. Using Missouri (MO) Medicaid claims data, an affiliated consulting group identifies patients meeting the National Quality Forum criteria for persistent moderate-to-severe asthma. A drug regimen review is performed for each patient by a community pharmacist. The pharmacist contacts the patient to complete a comprehensive medication review to identify drug-related problems and administers a pre-test to assess each patient’s asthma understanding. The pharmacist faxes recommendations to each patient’s primary prescriber. Follow-up occurs 30 days later and a post-test is conducted to assess changes in knowledge.

Drug-related problems, prescriber recommendations, pre and post test results, and pharmacist time will be compared. Descriptive statistics will be used to report demographic information, drug-related problems, and recommendations. A paired t-test will be used to assess changes in educational test scores. Investigators hope results can be utilized as evidence of community pharmacists’ contribution to patient outcomes and provide guidance to expand the service.

Learning Objective:
Determine the most frequent drug-related problems identified by community pharmacists for Missouri Medicaid patients with moderate-to-severe persistent asthma.
IMPLEMENTING USP <71> STERILITY TESTING PROCESS TO EXTEND THE BEYOND USE DATE OF COMPOUNDED STERILE PRODUCTS AT AN ACADEMIC MEDICAL CENTER Bryan Haugen, Dana Newman, Diane Ehlers. Fairview Health Services, 420 Delaware Street SE, Mayo C-265A (MMC 611), Minneapolis, MN 55455. Bhaugen4@fairview.org

United States Pharmacopeia (USP) Chapter <797> has established sterile compounding standards in order to ensure patient safety. In doing so, USP defines limitations for beyond use dating of compounded products based on storage setting and probability of contamination during the compounding process. Adhering to USP <797> guidelines may present a number of limitations. Increased waste, overproduction, and storage restrictions may be caused by following USP <797> guidelines, leading to inefficiencies throughout the institution. USP Chapter <71> outlines criteria for extending the beyond use date of compounded sterile products through sterility testing. Achieving extended beyond use dating of sterile products may allow these challenges to be overcome.

The goal of the project is to develop and implement a process to achieve extended beyond use dating of compounded sterile products in an Academic Medical Center. A second goal is to review the return on investment of USP <71> sterility testing.

The implementation of the compounding process will be assessed based on the successful completion of the sterility testing. A financial analysis will be completed to assess production time, product waste, and distribution throughout the hospital to be utilized in the return on investment.

By implementing a process to increase the beyond use date by meeting USP <71> standards, reduction in production frequency, waste and increased distribution will provide improved patient access and financial benefits to the Academic Medical Center.

Learning Objective:
Describe a process to achieve extended beyond use dating of compounded sterile products

IMPLEMENTATION AND QUALITY ASSESSMENT OF A RENAL DOSING PROTOCOL IN THE INPATIENT PHARMACY Will Hawes, Sherry Myatt, Bryan Bordelon, Brian Jolly. UAMS Medical Center, 4301 West Markham, #571, Little Rock, AR 72205. whawes@uams.edu

Many medications require dose adjustments based on renal function. At UAMS Medical Center, a Pharmacy and Therapeutics (P&T) Committee-approved renal dosing protocol has been developed and implemented for the inpatient pharmacy. The Cockcroft-Gault formula will be used to estimate creatinine clearance (CrCl). The protocol allows pharmacy staff to adjust dosing during order verification based on the calculated CrCl from a specific list of medications in order to maximize drug benefit and minimize adverse drug reactions. The implementation of this protocol will help streamline the process of order verification and minimize prescriber interruption for dose changes.

The purpose of this quality assessment is to analyze renal dose adjustment and identify strategies to improve medication dosing for adult patients in the hospital setting. A retrospective chart review of adult inpatients with renal impairment will be conducted to compare the impact of pharmacist interventions pre-versus post-implementation of the renal dosing protocol. This study will examine medications that are being dose-adjusted within the protocol and will review the appropriateness of dose and frequency based on estimated CrCl at time of order verification, and determine if changes in renal function were followed appropriately by the healthcare team. Results will be presented using descriptive statistics. The results of this study will be used to optimize the renal dosing protocol to improve appropriate prescribing of medications based on renal function and evaluate current prescribing patterns that may have a negative impact on patient care.

Learning Objective:
Identify strategies with potential to decrease mismanagement of renally-dosed medications in a hospital pharmacy setting.
EVALUATION OF AN INPATIENT HIGH-ALERT MEDICATION LIST USING AN OBJECTIVE, STANDARDIZED MEDICATION SAFETY TOOL Brittany Hawke, Ross Fishman, Jill Strykowski, 4050 Coon Rapids Blvd NW, Coon Rapids, MN 55433.
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There are an estimated 380,000-450,000 preventable adverse drug events (ADEs) annually. ADEs result in increased costs and patient harm. Of the moderate or severe ADEs, a significant number are due to high-alert medications (HAMs). Historically, HAMs have been identified based on retrospective review of ADEs. The High-Alert Medication Stratification Tool – Revised (HAMST-R) is an objective, standardized medication safety tool that can be used to assess and predict high-alert drugs prospectively.

The primary objective is to evaluate our hospital’s HAM list. A secondary objective is to determine if any medications should be added to our hospital’s HAM list.

Using the HAMST-R assessment, current medications found in our hospital’s HAM list will be scored. Medications that have a score of 4 or higher will be labeled as HAMs. Medications that have a score of 7 or higher will be identified as medications with the highest risk to patient safety. Medications with scores less than 4 will be assessed at a Pharmacy and Therapeutics (P&T) committee meeting to determine if they should be removed from the HAM list. Then, the HAM lists from the other 11 hospitals within the health-system will be reviewed to identify additional medications that are not currently on our hospital’s HAM list and have a HAMST-R score 4 or higher (with usage) will be reviewed to determine if they should be added to our HAM list.

Results of this analysis may result in changes to our HAM policy and a decrease in adverse drug events related to HAMs.

Learning Objective:
Describe the utility of the High-alert Medication Stratification Tool-Revised (HAMST-R) in assessing and decreasing adverse drug events due to high-risk medications.

INTRACRANIAL HEMORRHAGE AND INCIDENCE OF VENOUS THROMBOEMBOLISM Nicole Heeren, William Coolidge, Kari Taggart. Avera McKennan Hospital, 1325 S Cliff Ave, Sioux Falls, SD 57115

Currently, there is not a consistent approach to providing venous thromboembolism (VTE) prophylaxis in patients with intracranial hemorrhage (ICH). Previous studies have shown that initiation of chemical VTE prophylaxis does not increase the risk of bleeding and decreases the risk of venous thromboembolism. The objective of this study is to assess incidence of VTE occurrence in patients with chemical VTE prophylaxis admitted with intracranial hemorrhage versus those without chemical VTE prophylaxis.

The institutional review board approved this retrospective, chart review study of 199 adult patients with an ICD-10 diagnosis code for ICH between October 1st, 2015 and June 30th, 2017, at Avera McKennan Hospital in Sioux Falls, South Dakota. Patients were classified as traumatic or non-traumatic ICH using ICD-10 diagnosis codes. Patients with traumatic ICH were stratified based upon ICH severity using injury severity scores from the national trauma registry. Exclusion criteria included patients who expired within 48 hours of admission, inmates, pregnant patients, and hospice patients.

Outpatient antiplatelet and anticoagulation use was recorded. Data was collected evaluating use of mechanical and chemical prophylaxis, use of therapeutic anticoagulation, incidence of VTE and survival to discharge. The primary outcome of this study is to evaluate the incidence of VTE in patients with ICH. Secondary outcomes include evaluating timing of chemical VTE prophylaxis initiation after an ICH, determining if delayed chemical VTE is associated with increased risk of VTE, and assessing if chemical VTE prophylaxis increases the risk of bleeding in patients with an ICH.

Learning objective:
Describe guideline recommendations for venous thromboembolism prophylaxis after an intracranial hemorrhage.
In recent years, urinary tract infection (UTI) caused by extended-spectrum beta-lactamase (ESBL)-producing *Enterobacteriaceae* and carbapenem-resistant *Enterobacteriaceae* (CRE) has become more common and poses a significant challenge to clinicians due to limited treatment options. Multi-drug resistant uropathogens often require the use of broad-spectrum agents that further contribute to antibiotic resistance and increased hospital expenditures. Standard intravenous (IV) therapy agents used in this setting include carbapenems, aminoglycosides, colistin, ceftolozane/tazobactam and ceftazidime/avibactam.

The use of oral fosfomycin for the treatment of ESBL or CRE UTI has the potential to minimize IV antibiotic exposure, decrease antibiotic costs and shorten hospital length of stay. In addition, IV agents can be reserved for severe infections to avoid emergent resistance. The objective of this study is to determine if fosfomycin is as effective as standard therapy for the treatment of ESBL or CRE UTIs.

A retrospective cohort investigation was performed for patients admitted to the Houston Methodist system from June 2016 to September 2017. ESBL and CRE positive urine culture results were cross-referenced with drug utilization reports from the electronic medical record and eligible patients were divided into two groups: fosfomycin and standard IV therapy. To be placed in the fosfomycin group, patients could receive no more than 72 hours of other active antimicrobial therapy. The primary purpose of this study is to assess functional cure rate, defined as either a negative repeat urine culture or lack of follow-up urine culture and analysis (suggesting likely clinical cure). Clinical outcome analysis is currently ongoing.

**Learning objective:**

To discuss the benefits of oral fosfomycin for the treatment of extended-spectrum beta-lactamase-producing *Enterobacteriaceae* and carbapenem-resistant *Enterobacteriaceae* urinary tract infections
The development of antibiotics has made it possible to treat infections that were once life-threatening. However, proper antibiotic use is necessary to improve patient outcomes, reduce adverse effects and reduce overall cost. The CDC reports that as much as 50% of all prescribed antibiotics in the United States are either inappropriate or unnecessary. Exposure to unwarranted antibiotics can put patients at an increased risk for side effects and at a greater susceptibility to multi-drug resistant organisms.

Antibiotic resistance is a growing public health concern with an estimated 23,000 deaths annually due to infection from an antibiotic-resistant organism. An increasing body of evidence has shown that the use of antimicrobial stewardship programs can optimize antibiotic treatment and reduce adverse events.

The purpose of this research is to evaluate the impact of pharmacist intervention after implementation of two pharmacy policies developed to improve antibiotic stewardship measures within St. Luke’s Hospital. A retrospective analysis will be performed for January and February one year prior to policy implementation and two months post implementation to evaluate for difference in days of therapy in patients started on vancomycin and/or piperacillin-tazobactam. The primary outcome of this research is to determine if pharmacist intervention will reduce duration of therapy for patients on vancomycin and/or piperacillin-tazobactam. This study will also evaluate whether intervention resulted in discontinuation or de-escalation of antibiotic therapy and explore potential cost savings based on policy utilization. The results of this analysis will be used to enhance antibiotic stewardship practice at St. Luke’s Hospital.

Learning Objective:
Describe how pharmacist intervention can positively impact antimicrobial stewardship outcomes through reducing the duration of therapy with broad-spectrum antibiotics

Asymptomatic bacteriuria is characterized by presence of bacteria in the urine without signs or symptoms of infection. Between 20-80% of cases are inappropriately treated. Treatment is only indicated for pregnant women and patients undergoing urologic procedures such as transurethral prostate resection. Treatment when it is not indicated may be associated with increased antimicrobial resistance, risk of side effects, and costs.

The primary objective of this study is to determine the rate of inappropriate treatment of asymptomatic bacteriuria in Mercy Medical Center-Cedar Rapids’ Emergency Department. A secondary objective is to determine factors associated with the treatment of asymptomatic bacteriuria and to identify incidence of Clostridium difficile infection and antimicrobial resistance within the following six months after treatment.

These objectives will be assessed through a retrospective cross-sectional study of 100 patients. Data will be collected via chart review for patients meeting the following inclusion criteria over a period of 1 year: age ≥18 years with a single, clean-catch voided urine specimen with ≥1 bacterial species isolated in a quantitative count of ≥100,000 cfu/mL or a single catheterized urine specimen with ≥1 bacterial species isolated in a quantitative count of ≥100 cfu/mL. Exclusion criteria include: age <18 years, pregnant, and patients undergoing a urologic procedure. The primary objective will be evaluated by determining the proportion of patients with asymptomatic bacteriuria inappropriately treated. The secondary objectives will be evaluated utilizing descriptive statistics.

The results of this study will be used to identify opportunities to incorporate appropriate antimicrobial stewardship in the management of asymptomatic bacteriuria.

Learning Objective:
Identify factors associated with the inappropriate prescribing of antibiotics for asymptomatic bacteriuria.
PHARMACIST-LED MANAGEMENT OF HYPOTHYROIDISM IN PRIMARY CARE WITHIN THE VETERAN POPULATION Renae Heuermann, Susan Burros, Patrick Spoutz, Kansas City VA Medical Center, 4801 E Linwood Blvd., Kansas City, MO 64128. renae.heuermann@va.gov.

Hypothyroidism is a common chronic disease with an increasing prevalence in the aging population. Treatment requires proper administration, management of drug interactions, and consistent adherence with levothyroxine in order to succeed in achieving and maintaining an euthyroid state. Collaborative care models have consistently demonstrated a positive impact on adherence and therapeutic outcomes in chronic disease management through pharmacist-driven interventions and patient education. However, clinical pharmacists at the Kansas City VA remain largely underutilized for hypothyroidism management.

The purpose of this project is to increase the utilization of clinical pharmacists for hypothyroidism management in an effort to increase access to care, achieve therapeutic outcomes, and improve medication adherence.

Patients were enrolled in the clinical pharmacy specialist clinic for hypothyroidism management through referral from Patient Aligned Care Team (PACT) providers or identification via population-health management reports. A Veterans Integrated Service Network (VISN) 15 Levothyroxine Patient Management Report was developed to proactively identify patients indicated for thyroid replacement therapy, patients taking levothyroxine with recent out-of-range TSH levels, and patients non-compliant with levothyroxine per recent refill histories.

The primary outcome is to increase the number of patient encounters for hypothyroidism management in the clinical pharmacy specialist clinics. Laboratory adherence, non-pharmacological interventions, and the percentage of patients reaching an euthyroid state will also be evaluated. Descriptive statistics will be used to illustrate the data.

The results of this project will be used to optimize the utilization of clinical pharmacy services for chronic disease state management of primary care patients at the Kansas City VA.

Learning Objective:
Discuss the impact of clinical pharmacy specialists in the management of hypothyroidism.

A EVALUATION OF THE EFFICACY AND SAFETY OF DIRECT ORAL ANTICOAGULANTS IN CANCER PATIENTS WITH VENOUS THROMBOEMBOLISM Ashley Hickey, Caitlin Forness, Mercy Medical Center, 701 10th Street SE, Cedar Rapids, IA 52403. ahickey@mercycare.org

Enoxaparin is currently the first-line treatment in cancer patients with venous thromboembolism (VTE), but it is often expensive, inconvenient, and undesirable for patients. Sub-group analyses from major trials (AMPLIFY, EINSTEIN, and RE-MEDY) have shown direct oral anticoagulants (DOACs) have similar efficacy to enoxaparin, followed by warfarin, in patients with cancer, but there are few randomized controlled trials focused on this population. A direct oral anticoagulant could provide effective VTE prophylaxis without the discomfort, inconvenience, and decreased quality of life often associated with enoxaparin and warfarin in this population.

The purpose of this study is to perform a retrospective analysis to evaluate the efficacy and safety of apixaban, dabigatran, and rivaroxaban in cancer patients with venous thromboembolism. The analysis will be performed using the electronic medical records of all patients in Hall-Perrine Cancer Center (HPCC), an oncology center at Mercy Medical Center. The primary efficacy endpoint will be occurrence of symptomatic deep vein thrombosis or pulmonary embolism (DVT/PE), or VTE-related death, confirmed via objective test (i.e. CT or ultrasound). The primary safety endpoint will be incidence of major bleeding, defined as overt bleeding accompanied by: hemoglobin decrease of 2 g/dL or more, transfusion of two or more units of packed red blood cells, or fatal bleeding. Primary outcomes of safety and efficacy will be demonstrated as a proportion of patients affected.

With these results, we hope to provide guidance to HPCC providers in choosing anticoagulants that are safe for this high-risk population without compromising patient satisfaction and quality of life.

Learning Objective:
Discuss the advantages and disadvantages of various anticoagulants available for cancer patients with venous thromboembolism, particularly the safety and efficacy of DOACs in this unique patient population.
EFFECT OF HEMODYNAMIC INSTABILITY ON THE INITIATION OF POST-INTUBATION SEDATION IN THE EMERGENCY DEPARTMENT Ai-Chen (Jane) Ho, Daniela Espino, A. Carmine Colavecchia. Houston Methodist Hospital Texas Medical Center, 6565 Fannin Street, MS DB1-09, Houston, TX, 77030. Aho2@houstonmethodist.org

Rapid sequence intubation (RSI) is the standard of care for patients who are unable to maintain their airway. RSI occurs often in the emergency department (ED), and it is standard practice to administer sedative medications along with paralyzing agents to facilitate visualization of the airway during RSI. Providers may delay administering continuous sedation post-RSI in patients who are hemodynamically unstable to prevent exacerbation of a patient’s hemodynamic instability.

The purpose of this study is to determine time to initiation of post-intubation sedation/analgesia in hemodynamically unstable patients post-RSI compared to patients who are not hemodynamically unstable. A secondary purpose is to assess the selection of post-intubation sedation or analgesia, dosing, patient hemodynamics, and occurrence of hypotension post intubation.

This retrospective cohort group study was reviewed and approved by the Institutional Review Board (IRB) and includes patients between July 2016 to October 2017. Patients were included if they were greater than 18 years of age, admitted to the ED with recorded administration of etomidate, and one of the identified neuromuscular blocker (NMB) in a RSI event. Descriptive statistics will be calculated and linear regression analysis conducted to assess the results.

The results of the study will be used to assess the appropriateness of sedative agents and to determine the need for additional education for the medical team in the ED concerning the time to initiate post-intubation analgesia in hemodynamically unstable patients.

Learning Objective:
Describe the impact of time to initiating continuous analgesia post rapid sequence intubation in hemodynamically unstable patients

CREATION AND IMPLEMENTATION OF A PHARMACY-SPECIFIC 30-DAY READMISSION RISK ASSESSMENT TOOL: THE MADE SCORE Kyle Hoelting, Evan Williams, Brittany Audiss, and Rafia Rasu, The University of Kansas Health System, 4000 Cambridge Street, Mailstop 4040, Kansas City, KS 66160. khoelting3@kumc.edu

Hospital readmission rates have risen to prominence as an objective measure of a hospital’s performance. Peer-reviewed, 30-day readmission scoring tools exist utilizing a wide variety of patient metrics. A pharmacy-specific assessment tool has yet to be developed. Pharmacists as a resource are limited and expensive; it is important to identify the most beneficial interactions between pharmacists and patients.

The purpose of this study is to determine if a pharmacy-specific assessment can identify patients at high-risk for 30-day readmission. The secondary purpose is to determine which domains within the assessment are most predictive of readmission rates.

This prospective, observational study involved the development and administration of a novel assessment tool (MADE Score) to inpatients who were then followed for 30-days post-discharge to quantify readmissions. The MADE Score is based on metrics specific to pharmacy including medications, access, demographics, and education. These domains have been chosen based on previous peer-reviewed literature scoring tools (The HOSPITAL Score, 8Ps, and the Lace Index) and expert opinion. The assessment consists of three components: a 9-question questionnaire, 5-chart review metrics, and 2 variables based on the interaction. The assessment is completed by pharmacy technicians upon a patient’s admission to The University of Kansas Hospital (TUKH) during the standard medication history interview process. The following patients were excluded; age <18 years, patient refusal, pregnant, altered mental status, Intensive Care Unit admission, or prisoners. 30-Day readmissions were collected via chart review. Qualitative and quantitative descriptive statistics, regression analyses, and chi-squared analysis will be conducted to evaluate results.

Learning Objective:
Identify metrics that increase risk of 30-day readmission post-discharge
IMPLEMENTATION OF A PHARMACIST-DRIVEN ASSESSMENT OF APPROPRIATE ANTIBIOTIC SELECTION IN PATIENTS WITH REPORTED BETA-LACTAM ALLERGY  
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Reported beta-lactam antibiotic allergies often lead to the avoidance of beta-lactam antibiotics. Despite the fact that less than 10% of patients carry a true allergy, the documented allergy often leads to an increased use of alternative antibiotics. These non-preferred antibiotics (NPA) have a large impact on cost, clinical outcomes, and antimicrobial resistance. A best-practice alert (BPA) in Epic® was developed to alert pharmacy staff that a patient with a documented beta-lactam allergy is receiving a NPA. An allergy assessment is then completed to determine previous beta-lactam antibiotic tolerance and identify severity and timing of the reaction.

The purpose of this study is to identify the impact the pharmacy-driven best-practice alert has on the incidence use of penicillins and cephalosporins in patients with a previously reported beta-lactam allergy. Secondary purposes of the study include: assessment of antimicrobial use, documentation of beta-lactam allergies, impact on hospital and intensive care unit length of stay, and incidence of adverse effects.

The results of the study will be used to determine if pharmacist intervention improves clinical outcomes and increases the use of penicillins and cephalosporins in appropriate situations.

Learning Objective: 
Describe the impact of a pharmacist-driven best-practice alert on antimicrobial use through the incidence of appropriate penicillin and cephalosporin use.

IMPROVING CHRONIC DISEASE STATE MANAGEMENT IN HOSPITALIZED PATIENTS WITH MENTAL ILLNESS  
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Medical care in psychiatric settings has been poorly investigated over time. Despite this, patients with mental illness are at an increased risk for developing chronic disease states (metabolic and cardiovascular). The development of these chronic disease states can be attributed to psychotropic side effects, patient lifestyle choices, and disparities in access, utilization and provision of health care services. Psychiatrists focus on improving patient's mental illness through group sessions, counseling and medications. Decentralized pharmacists may have a better opportunity to provide recommendations to improve preventative care and chronic disease state monitoring in this patient population through patient chart review.

The objective of this study is to assess appropriate preventative care measures based on best-practice standards developed by the U.S. Preventative Services Task Force. A secondary purpose is to assess for adequate monitoring and therapy adjustments in these patients diagnosed with diabetes mellitus and hypertension based on current treatment guidelines.

These objectives will be assessed through a pharmacist-driven intervention assessing for and recommending preventative care measures (aspirin, statin and vitamin D use) and for dose adjustments to anti-hypertensive and anti-hyperglycemic agents based on appropriate monitoring parameters.

The results of the study will be used to help to identify gaps in the treatment of chronic disease states in United Hospital's psychiatric population to highlight areas that can be improved with standardized pharmacist interventions.

Learning Objective: 
Discuss how a pharmacist intervention can be utilized to improve the chronic disease states and preventative care in a psychiatric population.
Readmission rates and Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scores are important areas of interest within the healthcare system. At Lake Region Healthcare in Fergus Falls, Minnesota, nursing staff has historically been in charge of medication education throughout the patient’s stay and upon discharge. However, quarterly HCAHPS scores have been consistently below the 75th percentile for the communication about medications domain.

This study will examine whether pharmacist intervention with patient discharge education can help reduce 30-day readmission rates and increase HCAHPS scores in areas pertinent to pharmacy. This study includes adult patients aged 18 years and older being discharged to their own independent home, following admission to Lake Region Healthcare. Patients discharged to a skilled nursing facility, long-term care facility, or those transferred to another hospital or institutional setting are excluded from the study. Prior to discharge, patients are educated on all new medications. Counseling points include medication indication, frequency, route, side effects, and any other counseling points the pharmacist deems important based on clinical knowledge.

HCAHPS scores and 30-day readmission rates will be collected for the six months following pharmacist intervention with discharge counseling (October 1, 2017 – March 31, 2018). These results will be compared to HCAHPS scores and 30-day readmission rates collected during the six months preceding pharmacist intervention (April 1 – September 30, 2017).

The results of this study will be used to implement changes to current discharge education practices in order to help improve patient satisfaction and provide optimal patient care.

**Learning objective:**
Identify the impact of pharmacist intervention with discharge counseling in a rural inpatient hospital setting.
Proton pump inhibitors (PPIs) are the leading evidence-based therapies for treatment of upper gastrointestinal disorders such as gastroesophageal reflux disease (GERD), dyspepsia, and peptic ulcer disease, as well as for reducing risk of gastric ulcer development. For most of these indications, PPIs are only intended for short-term treatment. While highly effective when used appropriately, numerous studies have documented overuse of PPIs in both primary and secondary care settings resulting in unnecessary cost, risks, and adverse effects.

A medication use evaluation (MUE) of PPIs newly prescribed at the time of inpatient discharge from the Minneapolis VA Health Care System (MVAHCS) found that discharge prescriptions for new PPI orders rarely included information about specific indication for therapy, and most did not specify intended duration of therapy or instructions for tapering dose following acute treatment. Furthermore, this evaluation revealed continuation of stress ulcer prophylaxis (SUP) beyond time of hospital discharge, which does not align with current guideline recommendations that limit treatment for SUP to the intensive care setting.

The purpose of this study is to evaluate trends in PPI prescribing at time of hospital discharge following implementation of changes to the electronic ordering system for SUP and pharmacist intervention during discharge medication reconciliation. This study will be completed via retrospective chart review. The results will be used to assess the impact of order set changes and pharmacist intervention, and to determine the need for further interventions to target improvement in appropriate prescribing of PPIs.

Learning Objective:
Identify when short term proton pump inhibitor treatment (≤8 weeks) is indicated on hospital discharge

Home infusion pharmacy requires vast amounts of coordination between providers, pharmacies, and nursing agencies in order to provide care for the patient. Pharmacies are responsible for dispensing the medication and all necessary supplies to complete the medication administration at home. If a supply selection error occurs, the patient could have delayed medication administration, staff could be fielding calls and coordinating additional deliveries and nurses would be unable to provide teaching to the patient.

The purpose of this research is to decrease supply selection errors by evaluating the current workflow and implementing various process improvement interventions.

ICARE reporting system was reviewed to discover trends in supply selection errors. Errors were categorized into the following groups: wrong supply, missing supply, too few supplies, and too many supplies. From the observation and evaluation of the current workflow, following interventions were made: new barcode scanners, education to staff on outcomes associated with incorrect supply, reorganization of supply location within the pharmacy, creation of a “look-alike-sound-alike” list for supplies, and updating current protocol for supply selection.

This research resulted in this institution updating the current protocol to require all supply selections to be verified by a second technician. Due to the nature of home infusion, accurate supply selection is essential for successful therapy. This institution has rolled out this new process and will monitor to see if error reporting decreases.

Learning Objective:
Describe interventions that can be used to ensure accurate supply selection within a home infusion pharmacy
MEASURING MEDICATION-RELATED EXPERIENCES AFTER FREQUENT REVIEW OF PATIENT’S NEW ORAL MEDICATIONS
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Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) is a standardized survey that objectively captures patients’ perspectives of hospital care with an intent to improve patient care. Within HCAHPS, there are two specific questions related to medication education, which are how often hospital staff educate patients about indications of new medications and their possible side effects. This incentivizes hospital staff to provide excellent inpatient medication education and pharmacists are well positioned to provide this service. Moreover, improving patients’ medication knowledge may also improve readmission rates.

The purposes of this study is to assess HCAHPS scores related to medication communication and 30-day readmission rates of neuro stepdown units at United Hospital after frequent patient education on their new oral medications.

Education will be conducted from January 2018 until March 2018 and results are expected to be available in April 2018. Data will then be compared to January to March 2017’s HCAHPS and readmission rates. Descriptive statistics will be calculated and chi-square analysis will be conducted to compare groups.

The results of this study will be used to implement changes at United Hospital and potentially demonstrate a new service that pharmacy can provide for patients moving forward.

Learning Objective:
Identify transitions of care services that pharmacists can provide to improve patient care and patient experience.

A QUALITY IMPROVEMENT PROJECT TO EVALUATE A PHARMACIST-DRIVEN VANCOMYCIN PROTOCOL FOR A LEVEL 1 TRAUMA CENTER
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Vancomycin, a glycopeptide antibiotic used to treat gram-positive bacteria, is dosed and monitored by clinical staff pharmacists at our institution. Our current vancomycin dosing strategies are non-standardized, rely primarily on professional judgment, and have resulted in varied practices, increasing the risk for inappropriate use. To address this critical issue, an evidence-based, pharmacist-driven dosing protocol, which includes an internally developed dosing nomogram, was designed and implemented in November 2017.

This quality improvement project is designed to assess the proportion of: 1) patients who achieve appropriate serum vancomycin levels; 2) patients who have sub/supratherapeutic serum vancomycin levels; 3) patients who develop acute kidney injury (AKI); and 4) clinical pharmacists who adhere to the protocol. Prior to protocol implementation, education was provided to clinical staff pharmacists. A chart review of 150 patients (≥ 18yrs) who received intravenous vancomycin therapy pre (n=75) and post (n=75) protocol implementation was conducted. We report the findings from our data abstraction. The results of this analysis will be used to modify the vancomycin protocol at Regions Hospital.

Learning Objective:
Determine the appropriate dosing and monitoring parameters for vancomycin therapy, and assess the effectiveness of the new pharmacist-driven vancomycin dosing protocol by comparing the proportion of patients who achieved vancomycin goal levels, and the proportion of patients who developed AKI before and after protocol implementation.
Our country has experienced what has been infamously labeled as an “opioid epidemic” for the last few decades, to the point that in 2010, it was reported that enough opioids were prescribed in the United States to supply every American adult with 5 mg of hydrocodone every 4 hours for a month. The opioid epidemic is a multifactorial problem that cannot be solved by focusing on one field of medicine; however, it is necessary to evaluate the opioid prescribing habits of emergency medicine providers, considering almost half of all emergency department (ED) visits are related to complaints of pain.

This study examines prescribing patterns of opioids upon discharge from the ED according to the Arkansas ED Opioid Prescribing Guidelines and the CDC guidelines for prescribing opioids for chronic pain. The primary intent is to elucidate whether any previously unexplored trends in prescribing opioids are noted amongst our ED providers. The results identify areas of improvement in regards to opioid prescribing in accordance with the guidelines mentioned above. The specific data includes the most common discharge diagnoses linked to an opioid prescription and the most common opioids prescribed. Implementation of the results include developing an ED opioid prescribing protocol, creating patient education materials, and standardizing the ordering process within the electronic health record for prescribing opioids upon discharge.

Learning Objective:
Identify the opioid prescribing trends amongst the ED providers and implement strategies to ensure the appropriateness of opioid prescriptions at discharge and the safety of the patients.

Veteran Affairs (VA) medical centers across the nation have implemented telehealth technology to provide timely access to healthcare for Veterans. Utilizing telehealth minimizes costs associated with travel while maintaining quality of care. The under-utilization of video-based appointments within the pharmacy department was identified as an area for improvement at VABHHCS. Home based primary care (HBPC) patients are likely to benefit most from this type of healthcare delivery due to inability to travel and need for frequent follow-up. Most general follow-up is conducted by phone or at the patient’s home. All pharmacy visits for HBPC patients are conducted by phone.

The primary objective of this quality improvement project is to improve patient care using an alternative delivery method of pharmacist medication therapy management (MTM) services for HBPC patients. Additionally, the project aims to evaluate Veteran and pharmacist satisfaction. A secondary objective is to increase utilization of telehealth services within the pharmacy department.

HBPC patients will be enrolled into the pharmacy MTM clinic for diabetes, hypertension, and/or dyslipidemia management. Pharmacy MTM visits will be conducted using video-based technology. Barriers to utilization will be assessed along with overall satisfaction of patients and providers after video-based appointments using questionnaires.

Questionnaire results will be used to guide changes to practice and improve quality of telehealth services for Veterans at VABHHCS.

Learning Objective:
Describe the outcomes of implementing video-based appointments within a clinical pharmacy setting.
Previous literature demonstrates a steady-state AUC:MIC ratio of ≥400 is associated with successful treatment of methicillin-resistant Staphylococcus aureus (MRSA) infections. This ratio is the current guideline-recommended target for optimal clinical efficacy. Additional literature shows traditional vancomycin trough levels do not reliably correlate with obtaining this goal AUC:MIC ratio.

The purpose of this retrospective study is to evaluate the correlation between vancomycin trough levels using traditional dosing methods and the AUC:MIC dosing method. The secondary purpose is to assess the incidence of acute kidney injury, hospital readmission within 30 days of discharge, and 30-day mortality.

The objectives are assessed by utilization of a retrospective, electronic medical record chart review of patients with a positive methicillin-resistant staphylococcus aureus (MRSA) culture treated with vancomycin. Adult patients admitted to Regional Health - Rapid City Hospital and Sanford USD Medical Center between January of 2015 and August of 2017 were reviewed for inclusion.

These results will be used to assist in the guidance of care for patients at Regional Health – Rapid City Hospital and Sanford USD Medical Center. The ability to better predict the pharmacokinetics for the dosing of vancomycin will contribute to improved patient care and therapy management.

Learning Objective:
Evaluate the correlation between vancomycin trough levels using traditional dosing methods and the AUC/MIC dosing method.
Penicillin allergy is the most frequently reported drug allergy in the United States, with a prevalence of 10% of the population and up to 15% of inpatients. This drug allergy is complicated further by cross-reactivity with cephalosporin antibiotics due to similar R1 side chains. Allergic cross-reactions to first-generation and third-generation cephalosporins may be as high as 10.9% and 1.1% respectively. Beta-lactam antibiotics are the most frequently prescribed class of antibiotics due to their high effectiveness and safety profile, potentially narrow spectrum of activity, and low costs. However, one of the primary factors limiting their use is the suspicion of drug allergy.

Identifying true drug allergies is a major obstacle for many providers, and the cause for the disparity is multifactorial. Although many patients may have never undergone a re-challenge, approximately 90% of penicillin-allergic patients may actually tolerate penicillin. Due to fear of anaphylactic reactions, providers are forced to unnecessarily avoid penicillin and related beta-lactam antibiotics and choose second-line agents which are broader-spectrum, more costly, and potentially more harmful.

The purpose of this study is to evaluate the implementation of a pharmacist-managed allergy assessment and penicillin skin testing service. Data will be analyzed via retrospective chart review, and descriptive statistics will be presented. The goal of this study is to evaluate the time to optimal antibiotic therapy and/or de-escalation of antibiotics. Secondary endpoints will also be evaluated. The results will be used to help ensure patients at UnityPoint Health receive optimal antibiotics while reducing costs and complications.

Learning Objective:
Utilize beta-lactam allergy assessment and penicillin skin testing to optimize antimicrobial treatment while minimizing drug interactions, adverse effects, cost, and exposure to broad spectrum antimicrobials.
**IMPACT OF AN ANTIMICROBIAL STEWARDSHIP TEAM ON THE MANAGEMENT OF **Staphylococcus aureus** BACTEREMIA**

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*Staphylococcus aureus* bacteremia (SAB) is an increasingly prevalent infection associated with significant morbidity and mortality. Proper management of SAB can be complex and requires adherence to quality of care measures to ensure that all factors of the infection are adequately addressed. As outlined in published guidelines, these measures of care include initiating appropriate intravenous antibiotics for proper duration of therapy, ordering repeat blood cultures at least every 72 hours, performing an echocardiogram when indicated, and source control. Currently, the gold standard of management of SAB consists of early consultation of infectious diseases (ID) physicians. The purpose of this observational, single center, retrospective, chart review study is to examine the impact of a pharmacy-centered antimicrobial stewardship team (AST) in adherence to quality of care standards in the management of SAB with or without an infectious diseases consultation.

Patients older than 18 years of age with documented positive blood culture and sensitivities for *Staphylococcus aureus* during hospitalization will be included. The primary outcome is to determine the adherence to quality of care standards for management of SAB as a composite outcome. Secondary outcomes include comparison of intensive care unit length of stay (LOS), overall hospital LOS, and 90-day readmission rate. In addition, adherence to the individual quality of care standards of the primary outcome will be evaluated. Descriptive statistics, student t-tests, and chi-squared tests will be used to evaluate primary and secondary outcomes.

**Learning Objective**

Analyze the impact of an antimicrobial stewardship team in the management of *Staphylococcus aureus* bacteremia

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**ICER: AN EVALUATION OF INTERVENTIONS AND OUTCOMES IN CRITICALLY ILL PATIENTS BASED ON THE USE OF THE ICU CONFUSION ASSESSMENT METHOD (ICAM), CRITICAL CARE PAIN OBSERVATION TOOL (CPOT), EARLY MOBILITY, AND THE RICHMOND AGITATION AND SEDATION SCALE (RASS)**

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Unnecessary variations in the assessment and treatment of pain, agitation, sedation, and delirium in intubated patients across and within intensive care units (ICUs) exists at our institution. To reduce this variability and improve patient outcomes, evidence supports using objective assessment tools (ICAM, CPOT, and RASS) and order-sets in accordance with the Society of Critical Care Medicine (SCCM) guidelines. We hypothesize that a protocol incorporating these tools and prioritizing early mobility will improve the quality of care, minimize unnecessary variability, and shorten the duration of both ICU and hospital length of stay as well as the duration of mechanical ventilation.

The primary aim of this study is to determine if the implementation of the ICER protocol results in a decreased total length of hospital stay (measured in hours). Secondary aims will be to determine if the implementation of the ICER protocol results in a decreased length of ICU stay and decreased time on mechanical ventilation (both measured in hours) and decreased mortality rates compared to a historical control group. The results of this study will provide valuable information about how to improve the treatment of intubated patients at our institution. Potential beneficial outcomes of this scalable and generalizable protocol include lighter sedation, less time on mechanical ventilation, and improved mortality rates.

**Learning Objective:**

Recognize the importance of using objective assessment tools and implementing early mobility in intubated, critically ill patients to improve outcomes.
Traditional blood cultures take 48 to 72 hours for identification and susceptibilities. While empiric broad-spectrum antibiotics continue during this time. Rapid molecular diagnostic testing has the ability to identify certain bacteria within three hours. This coupled with antimicrobial stewardship interventions has shown to reduce time to optimal antibiotic therapy and decreases broad-spectrum therapy. To provide greater coverage of culture follow-up, clinical staff pharmacists received training and additional tools to recommend optimal antibiotic therapy. The objective of this study is to determine if clinical staff pharmacists appropriately and promptly follow-up on rapid molecular diagnostic testing alerts compared to infectious disease pharmacists. A secondary objective of this study is to assess the comfort level and work-flow process of clinical staff pharmacists regarding the culture follow-up protocol utilizing rapid molecular diagnostic testing.

The primary objective will be assessed through a retrospective chart review. Patients with positive blood cultures will be included in this study, identified through the institution’s microbiology laboratory records. Study investigators will evaluate each pharmacist’s documented recommendation based on rapid molecular diagnostic testing results and patient specific criteria. Antimicrobial therapy recommendations deemed to be suboptimal by study investigators will include one of the following reasons: no de-escalation in therapy, no escalation to effective coverage, or lack of antimicrobial discontinuation if no indication. The secondary objective will be assessed through an anonymous Qualtrics survey via email.

The results of the study will be used to assess current rapid molecular diagnostic testing protocol and the need for additional education to improve patient care.

Learning Objective:
Describe opportunities to expand upon benefits of rapid molecular diagnostic testing in combination with real-time interventions.

While EHR technology has many benefits, research has shown that clinicians often fail to find answers to many of their clinical questions, and the largest obstacle is a lack of time to ask questions and find answers. EHRs have increased the need for quality filtering of information for both clinicians and patients as more medical information is made accessible. Our team of clinical pharmacists experiences these challenges when providing medication therapy management (MTM) to patients in an ambulatory setting.

The purpose of this project was to create a customized “Snapshot” tool within EPIC EHR to consolidate relevant patient information for our clinical pharmacists while providing MTM. The second purpose is to help other clinicians understand how to create similar tools to improve the efficiency of their practice.

The success of the project will be determined by surveying the clinical pharmacists before and after implementation to determine if they are able to find information more easily. Each clinical pharmacist will also record time taken to review patients before and after implementation for comparison. The tool designed through this work will be made available to our clinical pharmacy team when providing MTM services to patients. Also it can be used by future clinicians to implement similar tools across the health system.

Learning Objective:
To describe how EHRs display patient information and to explain how tools can be built in order to improve clinical practice.
Asymptomatic bacteriuria (ASB) is the presence of bacteria in a urine culture without correlating urinary tract infection (UTI) symptoms. A common misperception is that the presence of bacterial growth in urine cultures necessitates antibiotic therapy, resulting in inappropriate antibiotic use. Unnecessary antibiotic use can lead to resistance, adverse drug effects such as *Clostridium difficile* infection, and increased cost. In an effort to influence antibiotic use by reducing inappropriate prescribing for ASB and to promote optimal empiric antibiotic selection, Saint Luke’s Health System developed a computerized UTI treatment algorithm in the electronic medical record (EMR) to aid prescribers in assessing patients.

The effect of the EMR-based UTI treatment algorithm will be assessed by comparing a prospective cohort from November 2017-February 2018 to a retrospective cohort from November 2015-February 2016. Patients will be included if they were admitted in one of the 5 metropolitan hospitals (Saint Luke’s Hospital, Cushing, East, North, and South), were 18 years or older and had a urine culture ordered. Patients will be excluded if they required antibiotics for concomitant, non-UTI infection(s). Patient records will be examined to determine whether the patient presentation justified usage of an antibiotic per algorithm criteria and whether an antibiotic had been prescribed. The primary endpoint of this study is antibiotic prescription rate. Secondary endpoints include percent of appropriate empirical antibiotic selected, percent of drug-bug mismatches with empiric therapy selection, duration of antibiotic therapy, and rate of *Clostridium difficile* infections. The results of this process will help evaluate the effectiveness of the EMR-based UTI treatment algorithm.

**Learning Objective:**
To review the effect of an electronic medical record based urinary tract infection algorithm on reducing the rate of inappropriate prescribing for asymptomatic bacteriuria.

Drug diversion in health systems is a growing problem. Estimations of 10-15% of healthcare workers misuse alcohol or drugs at some point in their careers. Mitigating drug diversion within The University of Kansas Health System starts with education for healthcare workers. Recent improved processes of controlled substance monitoring and dispensing has opened opportunity to implement drug diversion education. This education will be implemented across the enterprise as foundational knowledge and awareness in drug diversion recognition, reporting and prevention.

The primary objective is to create a formal education plan about drug diversion for healthcare workers at The University of Kansas Health System improving patient services, while minimizing drug diversion through health system education plans. Additionally, to create a road map on implementation of drug diversion education and develop guiding principles as a resource for other healthcare organizations.

A comparison study will be conducted of pre-and post-survey results from education sessions and events to assess knowledge. The pre-and post surveys consist of multiple choice and range scores.

Educational groups consist of nurses, providers, pharmacists, ancillary medical services members and non-clinical staff. There will be a comparison on knowledge assessment based on survey results.

Implementing a Health System wide drug diversion education program from a top-down approach ensures a positive impact on how to recognize, report and offer resources surrounding drug diversion events. A complete program involving a diversion oversight committee, technological monitoring, response teams and human resource policies, supports a cultural change on handling drug diversion issues within a health system.

**Learning Objectives:**
Identify ways to develop a structured drug diversion education program that is sustainable and changes the culture within a health system.
Healthcare expenditures in the United States have increased, prompting a need for change. According to the American Society of Health-System Pharmacists, drug expenditures in the United States equated to approximately $35 billion, a 3% increase from the previous year. One contributing factor involves ordering medications while lacking information on medication costs and potential lower-cost alternatives. Displaying the cost of medications at order entry to providers may offer a cost-effective strategy to decrease health expenditures. Further studies are warranted to investigate whether a similar intervention could affect the prescribing habits of medications.

Modern electronic health record systems may provide pricing information and cost-effective alternatives in real-time to providers via logic-based, interruptive alerts. The purpose of this study is to examine changes in prescribing habits before and after implementing the display of real-time medication cost and cost-effective alternatives at order entry. This quality improvement quasi-experimental study will evaluate provider prescribing habits before and after implementing the display of real-time medication cost and cost-effective alternatives at order entry. The study team identified five medications to provide costs and alternatives to providers at order entry with a best practice advisory (BPA). The primary objective of the study is to examine the effect of real-time cost information on medication prescribing behavior, in addition to evaluating its effect on drug expenditures. Specific BPAs that guide providers to alternatives will be assessed using interrupted time series regression.

The results of the study will be used to implement changes in electronic medication prescribing practices in a seven hospital health system.

Learning Objective:
To identify the impact of real-time cost display, coupled with a lower-cost alternative, on medication prescribing behavior.
THE IMPACT OF DEXMEDETOMIDINE AS AN ADJUNCT TO BENZODIAZEPINES ON RATE OF INTUBATION IN CRITICALLY ILL PATIENTS TREATED FOR ALCOHOL WITHDRAWAL SYNDROME

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When alcohol withdrawal symptoms are not well controlled with standard benzodiazepine therapy, other adjunctive agents are used including antipsychotics, propofol, phenobarbital and dexmedetomidine. Dexmedetomidine, an alpha2-adrenergic agonist, is currently approved for use in sedation of mechanically ventilated patients in the ICU or for sedation prior to and during procedures. Dexmedetomidine is not FDA approved for alcohol withdrawal syndrome (AWS) but recent literature has supported its use to reduce benzodiazepine consumption and symptoms of withdrawal. In Wisconsin, where binge drinking is 6% higher than the national average, we have seen an increased utilization of dexmedetomidine as an adjunct to standard benzodiazepine therapy for the treatment of AWS. The purpose of this study is to assess the rate of intubation with dexmedetomidine as an adjunct to standard benzodiazepine therapy in comparison to standard benzodiazepine therapy.

This is a single center, retrospective, cohort study comparing adjunctive treatment options for adults admitted to the ICU with a primary diagnosis of AWS from January 1st, 2011 to June 30th, 2017. Rate of intubation will be compared utilizing the Pearson’s Chi-Square test. Subjects were identified for eligibility using a computer generated list derived from ICD-9/10 codes for alcohol withdrawal. Secondary outcomes include ICU length of stay, timing of intubation, CIWA-Ar scores, dexmedetomidine dosing and use of other adjunctive agents. It is predicted that dexmedetomidine used in conjunction with benzodiazepines may decrease the rate of intubation in patients treated for AWS.

Learning Objective:
Discuss the clinical impact of dexmedetomidine in conjunction to benzodiazepines for AWS.

MRSA NASAL CULTURE AND ITS ROLE IN DE-ESCALATION OF MRSA-TARGETED THERAPY

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The primary residence of Staphylococcus aureus in humans is the nasal cavity. Nasal colonization has proven to be a predictor of MRSA infection, especially in pneumonia. Primary literature has shown that the MRSA nasal swab has a very high negative predictive value in MRSA pneumonia, meaning that a negative result can accurately rule out MRSA pneumonia. Thus, a negative MRSA nasal swab result means that patients with pneumonia can be de-escalated from MRSA-active antibiotics.

The purpose of this study is to determine if a pharmacist-driven intervention consisting of reporting negative MRSA nasal swab culture results to physicians will decrease the duration of vancomycin therapy in pneumonia patients. The duration of therapy will be compared between a pre-intervention and a post-intervention group. Secondary outcomes include the length of hospital stay (days), in-house mortality, number of vancomycin levels, and number of vancomycin doses between the pre and post-intervention groups.

Participants will be identified through retrospective chart review of patients who had a diagnosis of pneumonia and received vancomycin from October 2016-January 2017 (pre-intervention) and October 2017-January 2018 (post-intervention). Data will be reported using descriptive statistics. Continuous and discrete variables will be analyzed with student t tests and Fischer’s exact test, respectively. A sample size of 128 patients total will be needed to detect a difference of one day in duration between the two study groups.

The results of this study will help improve our institution’s antimicrobial stewardship intervention of using the MRSA nasal swab to de-escalate from MRSA-targeted antibiotics in pneumonia patients.

Learning Objective:
Identify opportunities specific to your respective institution for implementation of a pharmacist-driven MRSA nasal swab de-escalation service.
Asymptomatic bacteriuria (ASB) is defined as bacteria in the urine without signs or symptoms of an infection. Antibiotic treatment does not decrease the prevalence of bacteriuria, the frequency of symptomatic urinary tract infections, morbidity, or mortality. Despite lack of supporting evidence, antibiotics are still used to treat ASB. The use of unnecessary antibiotics leads to multi-drug resistant organisms and opportunistic infections such as *Clostridium difficile*. The purpose of this study is to determine the percentage of patients being treated for bacteriuria without documented signs or symptoms of urinary tract infections on a general medical floor.

Retrospectively, data was collected through EPIC from February 2016 through August 2017. The patients included had to be 18 years or older be admitted to a general medical floor with an acute diagnosis for a urinary tract infection with a length of stay greater than 24 hours. The results of the retrospective review found that 82 of 236 patients (35%) had ASB. Of those 82 patients, 77(94%) were treated with antibiotics. The most common antibiotics used were levofloxacin and ceftriaxone. This review found that ASB is commonly mistreated. The Information gathered was evaluated for potential learning opportunities to improve patient care and appropriate antibiotic prescribing. Education was offered through an antimicrobial stewardship module called “Best practices in treatment of UTIs: Low-Hanging Fruit” and a one-time presentation on the importance of not treating asymptomatic bacteriuria, how to use the asymptomatic guidelines, and what complications can arise from unnecessary antibiotics. The prospective study is being conducted, using the same criteria as the retrospective study, to determine effectiveness of provider education. Patients will be followed from January 1st, 2018 to April 1st, 2018.

**Learning Objective:**
Review the characterization of asymptomatic bacteriuria, recognize how frequently asymptomatic bacteriuria is mistreated, and summarize the complications associated with improper treatment.
PHARMACIST ASSISTANCE WITH SHARED DECISION MAKING FOR DRUG THERAPY SELECTION IN PATIENTS WITH DEPRESSION Danielle Larson, PharmD, James Hoehns, PharmD, BCPS, FCCP, Northeast Iowa Medical Education Foundation, 2055 Kimball Avenue, Suite 101, Waterloo, IA 50702. DLarson@neimef.org.

Depression is a common, disabling and costly mental illness. The primary care setting is where the majority of patients present with symptoms of depression and where many receive initial treatment. Pharmacotherapy is considered a mainstay of treatment, particularly for patients with moderate to severe depression. Available evidence suggests that there is minimal difference in efficacy among antidepressants and that clinicians should consider other factors that are important to patients when selecting an antidepressant, including toxicities, burdens and cost.

The purpose of this quality improvement project is to determine the impact of using a shared decision-making tool on medication selection, patient satisfaction and adherence in patients with depression.

Physicians in a family medicine clinic will identify patients with major depressive disorder (MDD) who require pharmacotherapy. A pharmacist will discuss advantages and disadvantages of treatment options with eligible patients using a shared decision-making tool developed by Mayo Clinic. Patients’ medical records will be reviewed for interactions and contraindications to their preferred agent and the pharmacist will communicate this information to the provider, who will make the final determination of antidepressant prescribed.

Objectives will be assessed through a questionnaire completed by patients at the clinic. Patients will also be contacted at 14 and 30 days via telephone to discuss side effects, adherence and medication effectiveness.

The results of this project will be used to implement changes in shared decision-making practices at the clinic and to improve patient care and satisfaction.

Learning Objective:
Describe two advantages of shared decision making compared to traditional patient-clinician communication

ASPIRATION PNEUMONIA AND THE ROLE OF ANAEROBIC ANTIMICROBIALS Zachary Lawrence, Leah Sanchez and Scott Aldridge Saint Luke’s Hospital, 4401 Wornall Rd, Kansas City, MO 64111. zlawrence@saint-lukes.org

Pneumonia secondary to aspiration is a common diagnosis seen throughout hospital admissions. Suspected aspiration is frequently treated with empiric antibiotics. Treatment of aspiration pneumonia is driven by physical assessment and clinical judgment. There are no established guidelines for treatment of suspected aspiration pneumonia, reflected by variations in antibiotic choices. Clinicians regularly use broad spectrum antibiotics to empirically treat aspiration and overuse of these can lead to undesirable effects.

This study is intended to determine if additional coverage with anaerobic antibiotics for aspiration pneumonia decreases time to clinical stability. Secondary objectives to be measured are C.difficile rates, antibiotic costs, and percentage of antibiotic days on broad spectrum antibiotics.

All patients admitted to Saint Luke’s Health System between January 2015 and July 31, 2017 with an ICD9 or ICD10 code indicative of aspiration pneumonia will be collected. Clinical stability is defined as white blood cell count decreased by 50 percent from time of antibiotic administration or within normal limits, a temperature for 24 hours less than 100.5 degrees Fahrenheit, a decrease in oxygen requirements by 50 percent or on room air from initiation of antibiotics, and not requiring vasopressors.

The results of the study will be used to demonstrate the current use of anaerobic antibiotics in our institution and how they relate to appropriateness in aspiration pneumonia therapy.

Learning Objective:
Identify antibiotic prescribing habits when treating suspected aspiration pneumonia
Medication therapy management services are essential because medication mismanagement is a significant financial burden to the United States. Under Missouri State rule 20 CSR 2220-6.080, or Medication Therapy Services by Protocol, medication therapy services are provided by pharmacists that allow for the designing, initiating, implementing, or monitoring of a plan to monitor the medication therapy or device usage of a specific patient, or to enhance medication therapeutic outcomes of a specific patient in collaboration with a protocol with a physician.

The purpose of this study is to identify the potential revenue that is not being captured in our current model. A secondary objective will be to quantify pharmacist time spent on MTM and other non-measured services, standardize documentation process for decentralized pharmacy services, and lastly, evaluate the payor status of the population with documented iVENTs.

The objectives will be assessed through documented iVENT predetermined time’s that will then correlate with the 2018 CPT professional coding book by the AMA for Medication Therapy Management Services for billable opportunities for pharmacy provided services in protocol driven practice collaborative agreements with physicians.

The results of the study will hopefully establish a platform to meet the criteria for provider status to continue to bill for services provided by inpatient pharmacist.

**Learning Objective:**

Explain the process for billing inpatient pharmacy services.

Transitions of care is a growing field due to the opportunity to reduce medication errors. Most discharge processes involve the provider and nurses to complete patient discharge. The goal of this study was to examine the implementation of a pharmacist medication review to optimize medication orders prior to discharge.

The primary endpoint was to determine the percentage of discharging patients requiring a pharmacist intervention. Secondary endpoints included the type of intervention, error rate per hospital unit, pharmacist-led patient education, referrals for medication-therapy management, and overall time per patient review.

The study included adults with inpatient-status and a medication reconciliation completed by pharmacy staff. Patients excluded had elective surgeries, discharge from a mental health unit, or transfer to another hospital. The pharmacist reviewed discharge medication lists and reconciled them with prior-to-admission medications from 7:00 AM – 4:00 PM on weekdays. Necessary medication-related interventions were then relayed to the discharging provider for assessment and/or adjustment.

A total of 225 patients were reviewed during the 17-day study period. Of this group, 36% of discharging patients required a medication intervention. The most common drug therapy interventions fell into the indication (45%) or safety (40%) classifications. Overall, there is a significant need to optimize medication therapies upon discharge and to incorporate a pharmacist within the discharge process to prevent medication errors.

**Learning Objective:**

Describe the benefits of pharmacist involvement with hospital discharge medication review in a mid-size community hospital.
Pain control after total knee arthroplasty (TKA) has been considered especially difficult to manage, and has been associated with serious complications such as ischemic cardiac events, higher risk of infections, and development of chronic pain. Multimodal pain management is the combination of different analgesic agents acting synergistically to control pain. This method has been recommended for adequate orthopedic postoperative pain control. The most commonly used drugs for intraarticular injections include local anesthetics, such as ropivacaine, bupivacaine, and liposomal bupivacaine, morphine, ketorolac, and epinephrine. This has shown to promote maximum postoperative relief, lower opioid consumption, and improve patient satisfaction and quality of life.

The purpose of this study is to evaluate the efficacy of ropivacaine and epinephrine compared to liposomal bupivacaine in the multimodal pain management of TKA postoperative pain control. The study will assess data measures such as range of motion defined by maximally tolerated degree of knee flexion at discharge, level of assistance during physical therapy for functional independence, and four-hour postoperative ambulation.

These objectives will be assessed through data collection through the CHI Health St. Elizabeth computer database. Descriptive statistics, chi-square test, and t-test will be used to report baseline characteristics and information regarding hospitalization for the entire cohort.

The results of the study will be used to implement changes in our multimodal pain management for total knee arthroplasty postoperative pain control.

Learning Objective:
To discuss the efficacy of ropivacaine and epinephrine compared to liposomal bupivacaine in the multimodal pain management of total knee arthroplasty postoperative pain control
ACHIEVING THERAPEUTIC ANTICOAGULATION LEVELS IN AN ELDERLY POPULATION: AN EVALUATION OF AN INSTITUTION'S HEPARIN PROTOCOL

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Changes in pharmacokinetics and pharmacodynamics, along with an increased number of prescriptions, place the elderly population at higher risk of medication-induced adverse effects. Elderly patients have higher rates of anticoagulation-related bleeding, require less heparin to achieve therapeutic anticoagulation, have statistically significantly longer activated prothrombin times when compared to younger adults who've received initial bolus dosing and are at increased risk for supratherapeutic anticoagulation using unfractionated heparin.

The heparin protocol at Hennepin Health System (HHS) utilizes a weight-based nomogram and anti-factor Xa levels to guide heparin dosing. The purpose of this study is to assess the institution's heparin protocol in elderly and adult populations, to see if a response difference is observed following the initial bolus and the infusion doses.

This is a retrospective cohort study of hospitalized adults who were prescribed unfractionated heparin due to surgery, acute coronary syndrome or deep vein thrombosis/pulmonary embolism between February 11, 2016 and August 1, 2017. For the primary outcome, the anti-factor Xa level after protocol initiation will be determined to be subtherapeutic, therapeutic or supratherapeutic, relative to the institution's goal range of 0.3-0.7 IU/mL. Outcomes from the elderly population will then be compared to the remaining adults using a chi-squared analysis to detect a difference.

The results of this investigation will be presented to HHS's medication safety committee so that optimization of anticoagulation therapy using unfractionated heparin in the elderly population can occur.

Learning Objective:
Identify the response difference to anticoagulation with unfractionated heparin in hospitalized elderly and adult patient groups.

CEFTRIAXONE ONE GRAM VS. TWO GRAMS IN OBESE, HOSPITALIZED PATIENTS

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Current product labeling for ceftriaxone recommends either a 1 or 2 gram daily dose for several indications dependent on disease type and severity. However, clinical outcome data describing how patient characteristics (ie. critical illness, uremia, body habitus) may impact outcomes in acutely ill patients receiving different dosing strategies of ceftriaxone is lacking. The objective of this study is to evaluate the comparative effectiveness of ceftriaxone 1 vs 2 grams daily in acutely ill, obese patients.

This retrospective cohort study extracted data from the national VA electronic health databases through the VA Informatics and Computing Infrastructure. Patients were included if they had been admitted to a Veterans Affairs Hospital between August 2012 and August 2017, received at least 3 doses of ceftriaxone 1 gram or 2 grams daily, were hospitalized between 2 and 30 days, and weighed at least 100 kg. Patients with a discharge diagnosis of spontaneous bacterial peritonitis, meningitis, or endocarditis were excluded.

A total of 951 patients were included in this study. There were 796 patients who received 1 gram of ceftriaxone daily and 127 patients who received 2 grams of ceftriaxone daily. In the unmatched cohort, there was no difference in 30-day mortality between the ceftriaxone 1 and 2 gram cohorts [5.5% vs. 5.7% (P=1)]. Consistent with previously published pharmacokinetic data, these results suggest that in an acutely ill, obese patient cohort, 2 gram doses of ceftriaxone does not improve patient survival when compared to patients receiving 1 gram doses of ceftriaxone.

Learning Objective:
Describe the outcomes of 1 vs 2 gram dosing strategies of ceftriaxone in obese, hospitalized patients.
Patients with chronic kidney disease and end-stage renal disease (ESRD) are on a variety of medications and have multiple comorbidities that can affect their clinical outcomes. In addition, many medications are renally eliminated and this process is increasingly impaired as renal function declines. Due to the potential for drug interactions, drug-disease complications, and dosage adjustments these patients are at high risk for experiencing medication-related problems (MRPs). These factors lead to vast opportunities for ambulatory pharmacists to intervene and improve patient care, while reducing total cost of care.

The purpose of this project is to identify and evaluate pharmacist interventions made through comprehensive medication management for patients seen in an ambulatory nephrology clinic and a hemodialysis setting. The secondary purpose is to assess potential revenue based upon level of service provided. A final parameter is to measure patient satisfaction with comprehensive medication management services.

Medication-related problems will be categorized based upon definitions published in *Pharmaceutical Care Practice, 3rd edition* by Cipolle et al. Revenue data will be based on payment rates using Minnesota Department of Human Services HIPAA-compliant Medication Therapy Management Services Current Procedural Terminology (CPT) codes. Patient satisfaction data utilizing the Health-System Alliance for Integrated Medication Management published survey will be reviewed.

The results of this study will help identify a need for continued ambulatory pharmacy services in a health-system nephrology department.

**Learning Objective:**

Describe medication related problems identified when initiating comprehensive medication management in an ambulatory nephrology setting.

Eptifibatide is a reversible, competitive inhibitor of glycoprotein IIb/IIIa which is used to inhibit platelet aggregation during percutaneous coronary intervention. Pathologic bleeding is the most prevalent adverse effect associated with the use of eptifibatide. Data regarding factors that may increase a patient’s risk of bleeding with this drug is limited. The primary objective of this study is to determine the incidence of bleeding in patients who received eptifibatide during percutaneous coronary intervention for acute coronary syndromes at the University of Kansas Hospital with the secondary objective to determine patient factors associated with an increased incidence of bleeding.

A retrospective, single center case control study including patients who received eptifibatide during percutaneous coronary intervention for acute coronary syndromes was conducted. Information including the incidence and severity of bleeding during the hospital stay was collected in addition to patient demographics and medical history information from the electronic health record.

**Learning Objective:**

Identify the factors that increase the risks of bleeding in patients who receive eptifibatide during percutaneous coronary intervention.
PERCEPTION OF INTERPRETATION SERVICES FOR PATIENTS WITH ENGLISH AS A SECOND LANGUAGE DURING PHARMACIST-LED CHRONIC DISEASE STATE MANAGEMENT PROGRAMS  Laura E. Litwin, Janelle F. Ruisinger, Emily S. Prohaska, Katelyn M. Steele, Brittany L. Melton, Price Chopper Pharmacy, 7000 W 75th St. Overland Park, KS 66204. Laura.Litwin@ballsfoods.com

As the number of Americans identifying as English as a second language (ESL) increases, healthcare professionals should utilize appropriate resources to properly care for these patients. The communication barrier between ESL patients and healthcare professionals has been associated with lower satisfaction with care, decreased treatment adherence, and increased medication-related complications. While healthcare settings often have an interpretation service available, it is uncertain how patients perceive utilization of these services.

This study assessed perceptions of a telephonic interpretation service utilized during pharmacist-led chronic disease state management (DSM) programs with patients who identify as ESL. The study also determined if utilizing a language service during DSM appointments was of perceived significance to patients.

This study was limited to Spanish- and Hindi-speakers due to the prevalence of these languages in the DSM programs. After utilizing a telephonic interpretation service during DSM visits with ESL patients, pharmacists provided a single written, translated, cross-sectional survey to assess pre- and post-interpretation service perception of visit interactions. The survey contained questions on a 5-point Likert Scale, adapted from the Diabetes Disease State Management Questionnaire. Patient perceptions and perceived significance of the interpretation service were evaluated using Wilcoxon signed rank test.

Results from this study determined the utility of the telephonic interpretation service during pharmacist-led DSM appointments. Results may also be applicable to other services for ESL patients offered in community pharmacies.

Learning Objective:
Describe communication barriers that patients who identify as English as a second language experience in healthcare and solutions to overcome these barriers.

IMPACT OF COMMUNITY PHARMACIST INTERVENTION ON CONCURRENT BENZODIAZEPINE AND OPIOID PRESCRIBING PATTERNS  Georgia Luchen, Emily S. Prohaska, Janelle F. Ruisinger, Brittany L. Melton, Balls Food Stores and the University of Kansas School of Pharmacy, 13600 S Blackbob Road, Olathe, KS 66062. gina.luchen@ballsfoods.com

Opioids and benzodiazepines (BZDs), used alone or in combination, have been identified as common pharmaceuticals involved in drug-related deaths. To help address opioid/BZD misuse, abuse, and related overdoses, pharmacists are called to promote safe medication practices including helping reduce opioid/BZD co-prescribing.

This study sought to examine the impact of pharmacist intervention on opioid/BZD co-prescribing through evaluating the number of: 1. Opioid/BZD prescription changes resulting from the intervention; 2. Patients on concurrent opioid/BZD therapy from single versus multiple prescribers; 3. Opioid/BZD prescription changes that occurred when a single prescriber versus multiple prescribers were involved in a patient’s care; 4. Opioid/BZD prescription changes resulting from the two communication media utilized for the intervention.

The intervention was communicated via fax or Kansas Health Information Network (KHIN) messages that explained the opioid/BZD co-prescribing risk and prompted the prescriber to respond using standardized recommendations. Descriptive statistics assessed demographics and prescription changes. Spearman’s rho correlations compared prescription changes to number of prescribers.

Ninety-nine prescribers and 121 patients were included in the study. After the intervention, 22 (18%) opioid/BZD agents were discontinued or tapered in response to faxed recommendations. Sixty-nine (57%) patients had a single prescriber, while 52 (43%) had multiple prescribers. There was a positive correlation between the number of prescribers and a positive change in the opioid/BZD agent (p<0.01). No responses were received from providers contacted via KHIN messaging.

This study concluded that a faxed pharmacist intervention can help reduce opioid/BZD co-prescribing, especially when multiple providers are involved in a patient’s care.

Learning Objective:
To describe the impact of a pharmacist intervention on benzodiazepine and opioid co-prescribing patterns in community pharmacies in the Kansas City Metropolitan area.
RETROSPECTIVE ANALYSIS OF THE SAFETY OF 4-FACTOR PROTHROMBIN COMPLEX CONCENTRATE IN WARFARIN AND NON-WARFARIN PATIENTS Antonio Luo, Megan Dethlefsen, Ryan Walters, Wendy Weber. CHI Health Creighton University Medical Center-Bergan Mercy, 7500 Mercy Rd, Omaha, NE 68124. Antonio.luo@aleurent.org

Four-factor prothrombin complex concentrate (4PCC) is currently indicated for the urgent reversal of acquired coagulation factor deficiency induced by Vitamin K antagonist (VKA, e.g., warfarin) therapy in adult patients with acute hemorrhage. It is often used off-label for acute hemorrhage associated with non-VKA anticoagulation and less commonly for acute hemorrhage not related to anticoagulation. The literature evaluating the safety and efficacy for these off-label uses is limited. The objective of this study is to compare the safety and efficacy of 4PCC between warfarin and non-warfarin patients.

The electronic medical record system identified all patients who received 4PCC from April 1, 2015 to October 15, 2017 in six CHI Health Omaha metro hospitals. The primary endpoint is to compare the rate of thromboembolic events (TEEs) between warfarin and non-warfarin patients who received 4PCC. The secondary endpoints are to compare the mortality and effects of 4PCC on hemostasis between warfarin and non-warfarin patients during their hospital admission. The Cochran-Mantel-Haenszel (CMH) will be used for testing of the primary outcome. This would also give us the relative risk between the warfarin and non-warfarin group. Chi-square and Fisher’s exact tests will be used to analyze the secondary outcome.

The results of this analysis will contribute to the current literature regarding the safety and efficacy of 4PCC for patients with acute hemorrhage.

Learning Objective:
Review the uses of 4PCC in patients with acute hemorrhage

IMPACT OF A NEW ENTERAL FEEDING PROTOCOL ON NEONATAL TPN USE Sara Magill, Kim Raschke, Mary Gargano, Melissa Thoene, Ann Anderson-Berry, UNMC, 981090 Nebraska Medical Center, Omaha, NE 68198-1090. samagill@nebraskamed.com

The ideal goal of neonatal nutrition in preterm infants is to match in utero nutrient deposition and growth with that of a normally growing fetus of similar gestational age. However, the ability to provide adequate nutrition to meet these needs is limited by the preterm infant’s ability to tolerate full enteral feedings. For this reason, enteral feedings are augmented with total parental nutrition in order to provide adequate nutrition during this critical period of development. Although necessary to provide adequate nutrition, utilization of TPN introduces additional risks to the neonate such as TPN-associated cholestasis and line complications.

Literature suggests that early initiation of enteral feeding promotes gastrointestinal development, improving the neonate’s tolerance of feed advancement, and reducing the required number of TPN days. As a result, our institution recently made changes to the enteral feeding protocol for preterm infants in an attempt to provide increased enteral nutrition within the first few days of life. The purpose of this study is to determine if implementation of this new enteral feeding protocol has led to a decrease in total TPN days in our preterm neonatal population. This objective will be assessed through retrospective chart review one year pre- and post-protocol implementation, allowing for a three-month washout period. Descriptive statistics will be calculated and chi-square analysis will be conducted to compare groups.

The results of this quality improvement project will be used to either validate or guide future changes in the enteral feeding protocol in our preterm neonatal population.

Learning Objective:
Discuss the effect of aggressive initiation of enteral feeds on TPN utilization in premature infants in the Neonatal Intensive Care Unit.
INCREASED PLATELET COUNTS: POTENTIAL DIAGNOSTIC MARKER FOR OSTEOMYELITIS IN PATIENTS WITH CHRONIC ULCERS? Mason Magle, Megan Magle, Tze Shien Lo, Renae Schiele, Jeff Braaflat, William Newman. Fargo Veterans Affairs Medical Center, 2101 Elm Street, Fargo, ND 58102. mason.magle@va.gov

Chronic leg ulcers are a common problem associated with significant morbidity which compounds upon progression to osteomyelitis. Differentiating between the two is difficult, often requiring imaging studies, but essential for appropriate therapy. Laboratory tests such as c-reactive protein and sedimentation rate are known to be useful in diagnosing osteomyelitis. Additionally, reactive thrombocytosis is known to occur with infection and was detected more frequently in patients with osteomyelitis compared to those with chronic leg ulcers by Schattner et al. We sought to expand upon whether platelet counts can help differentiate osteomyelitis from chronic leg ulcers.

Platelet counts from 213 patients admitted with osteomyelitis versus chronic leg ulcers were obtained via retrospective chart review; levels at baseline and on diagnosis were compared. Diagnoses were confirmed via imaging studies, pathology, probe-to-bone tests, and/or clinically by the provider. The primary outcome studied was change in platelet count on diagnosis from baseline which was statistically significant for differentiating osteomyelitis from chronic leg ulcers but not clinically relevant (26 versus 5 x10⁹/L, p=0.002). A platelet count threshold >350 x10⁹/L for differentiating osteomyelitis versus chronic leg ulcer showed a sensitivity of 0.24 with a specificity of 0.93.

In patients presenting with chronic leg ulcers concerning for osteomyelitis, a platelet count threshold >350 x10⁹/L is highly specific for aiding in the diagnosis of osteomyelitis versus chronic leg ulcer. Additional laboratory tests, imaging, and clinical picture should be utilized to confirm a diagnosis of osteomyelitis versus chronic leg ulcer. Further trials are warranted to confirm the findings of this study.

**Learning Objective:**
Define the utility of reactive thrombocytosis in the diagnosis of osteomyelitis versus chronic leg ulcer

IMPLEMENTATION AND EVALUATION OF A PHARMACY COMPLIANCE MANAGEMENT SYSTEM Kevin Mahler; Korby Lathrop; Justin Schmidt; The University of Kansas Health System, 3901 Rainbow Boulevard, Mailstop 4040, Kansas City, Kansas 66160. kmahler@kumc.edu

Pharmacy is one of the most regulated areas within healthcare. As regulations continue to tighten, pharmacy departments need an all-encompassing system to maintain accurate records and to ensure proper compliance actions are being taken. Currently, systems on the market have a narrow scope and do not fully address the compliance activities that need to be performed by pharmacy departments. This can push organizations to use multiple systems or utilize paper systems to keep up with compliance responsibilities.

The primary objective of this project is to increase efficiency of our compliance processes by automating necessary compliance processes within a single, centralized system. This was achieved by working with a third-party vendor to create a system that can be utilized to track our compliance efforts, provide staff with reminders to complete those efforts, and have escalation mechanisms embedded within the system to alert supervisors to non-compliance.

The new automated process will replace the current workflows of the pharmacy staff. The system will be designed to cover all entities that regulate the pharmacy profession, be reproducible from one central location, and increase overall compliance throughout the department. A pre/post survey will be administered to the pharmacists to assess satisfaction and efficiency before and after implementation.

**Learning Objectives:**
List important characteristics/features to consider when selecting a compliance software solution.

Describe the benefits of implementing a compliance software solution.
Implementation of telepharmacy services in remote emergency departments is a newer concept for health-system pharmacy. The return on investment for expanding clinical pharmacy services is dependent on the current pharmacy staffing model at the contracted hospital, patient needs of the remote emergency department location, resources and business need.

The purpose of this project is to evaluate current pharmacy services and determine if able to expand existing services at WestHealth Emergency Department and Urgent Care Center (WHEDUC).

Data analysis of off-site central pharmacist and emergency department (ED) pharmacist workload, WHEDUC visits and percentage of visits resulting in inpatient admission. These metrics were used to formulate a business case for an on-site pharmacist role versus telepharmacy strategies provided remotely for WHEDUC. Preliminary results of patient visit opportunity and other pharmacist services do not support an on-site full time equivalent at WHEDUC. Further data will be analyzed to separate ED and urgent care visits as well as discharges to outside hospitals. Opportunities to implement remote site telepharmacy strategies such as medication history and stage checking of immediate-use nurse compounding will be further analyzed.

The results of this projects will be used to implement telepharmacy strategies such as stage checking, remote pharmacist care team collaboration for complex case management and remote patient interview for medication histories. This project influences the pharmacy practice model in the health-system by expanding pharmacist services outside the hospital and pioneering telepharmacy strategies to meet outpatient patient care needs.

Learning Objective:
Describe innovative strategies to expand pharmacy services at a freestanding emergency department and urgent care facility.
Paclitaxel infusion is known to cause HSR, including dyspnea, flushing, tachycardia or hypertension at rates of seven to ten percent. Severe reactions include arrhythmias, angioedema, unresponsive hypotension and cardiac arrest at rates of 0.7 to two percent. Premedication with dexamethasone, famotidine and diphenhydramine can decrease the risk of HSR. HSR occur within the first hour of infusion, during the first three doses and independent of infusion duration, but current evidence supporting or refuting titration is lacking.

The purpose of this study is to compare the hypersensitivity reactions (HSR) during paclitaxel infusion with and without first dose infusion rate titration.

Trinity Health CancerCare Center changed from utilizing an infusion rate titration protocol to not titrating paclitaxel infusion rate on July 15, 2017. Infusions utilizing the titration protocol between July 1, 2014 and July 14, 2017 and infusions without titration from July 15, 2017 to present have been identified through the electronic health record and compared. Patients were excluded if they have received paclitaxel for previous cycles or treatment. Incidence, severity, symptoms, demographics, medical history and medication lists were recorded. Patient information was de-identified by coding and entered into Microsoft Excel for evaluation. The primary outcomes are the incidence and severity of HSR to paclitaxel and will be evaluated through t-tests of independent samples. Preliminary data suggests decreased incidence of mild to moderate HSR with titration, but no difference in severe HSR. Secondary outcomes include which dose the HSR occurred, symptoms and trends associated with demographics.

Learning Objective:
By the end of this presentation, the audience should be able to explain the effect of first-dose rate titration of paclitaxel on incidence and severity of hypersensitivity reactions.

Bivalirudin, in relation to heparin, is in its clinical infancy. With 60 fewer years on the market and a narrower range of indications, including percutaneous transluminal coronary angioplasty (PTCA) for unstable angina, percutaneous coronary intervention (PCI) when used in conjunction with a glycoprotein IIb/IIIa inhibitor, and PCI in patients with HIT, existing literature surrounding bivalirudin is understandably limited. The number of studies focusing on pharmacist-driven dosing protocols of bivalirudin is even sparser. To date, only one small, single-center study has evaluated a pharmacist-driven bivalirudin protocol, which found favorable results in terms of time to therapeutic aPTT and bleeding rates compared to lepirudin and argatroban.

The purpose of this study is to determine if the implementation of a pharmacist-driven dosing protocol for bivalirudin influenced the number of patients who obtain 2 consecutive therapeutic aPTTs within the first 24 hours of therapy. Other purposes include assessing the number of critically high laboratory values, medication-related incident reports and the number of custom infusions used.

A retrospective chart review will be conducted for patients who received bivalirudin both before and after the implementation of the pharmacist-driven protocol. Descriptive statistics and subgroup analyses of selected patient populations will be performed.

The results of this study will be used to justify expanding clinical pharmacists’ scope of practice with different dosing protocols, from both an efficacy and safety perspective.

Learning Objective:
Identify the safety and efficacy impacts of a pharmacist-driven bivalirudin dosing protocol.
COMPARISON OF RAPID MOLECULAR DIAGNOSTIC PLATFORMS IN CONJUNCTION WITH ANTIMICROBIAL STEWARDSHIP EFFORTS FOR GRAM-POSITIVE BLOODSTREAM INFECTIONS

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Bloodstream infections (BSIs) are associated with increased mortality, hospital costs, and longer length of stay. Patients are often empirically treated with broad-spectrum antimicrobials, which may not always be the most optimal therapy for the infecting organism. Early organism identification and detection of antimicrobial resistance directly from blood cultures can facilitate earlier targeted treatment.

Matrix assisted laser desorption ionization time of flight mass spectrometry (MALDI-TOF MS) in conjunction with antimicrobial stewardship efforts has been shown to reduce length of stay, hospital costs, and mortality in patients with gram-negative bacteremia. However, issues this platform include inability to detect the absence or presence of resistance genes and identification of gram-positive organisms directly from positive blood cultures due to their thick cell walls. BioFire Diagnostics FilmArray Blood Culture Identification (BCID) system is a polymerase chain reaction (PCR) based platform capable of identifying multiple bacterial species including the presence of resistance genes, including mecA and vanA/B.

The purpose of this study is to compare clinical and economic outcomes after implementation of the PCR platform versus a historical cohort of patients when the MALDI-TOF MS was the sole method of organism identification for individuals with bacteremia due to Staphylococcus aureus or Enterococcus spp. The objective is to determine if any advantages exist using the PCR platform compared to the MALDI-TOF MS, both in conjunction with real-time antimicrobial stewardship efforts. The primary endpoint is time to order placement of most optimal antibiotic therapy. Additional endpoints include length of stay, total hospital costs, and 30-day mortality.

Learning objective:
Discuss the advantages of utilizing a PCR-based platform versus mass spectrometry for patients with gram-positive bacteremia.

INCIDENCE OF INVASIVE FUNGAL INFECTIONS IN HIGH-RISK ONCOLOGY PATIENTS

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Invasive fungal infections (IFI) are associated with a high level of morbidity and mortality as well as a significant consumption of healthcare resources. IFIs are difficult to treat and the attributable mortality rate in high-risk patients approaches 80% according to some reports.

Prospective trials have shown posaconazole to be superior to fluconazole for the prevention of mold infections in high-risk patients (AML/MDS undergoing induction chemotherapy and HCST patients with GVHD). Its use is recommended by several guidelines. At our academic medical center, voriconazole is the preferred prophylactic agent for high-risk patients. The body of literature supporting the use of other agents, such as voriconazole, in this population is limited and its effectiveness is inferred from data using other mold-active agents, like posaconazole.

The primary objective of this study is to describe the incidence of invasive fungal infections in patients being treated for AML/MDS or GVHD following HSCT. Secondary outcomes include classification of fungal according to consensus criteria, characterization of isolated fungal pathogens, distribution of anti-fungal prophylaxis, and fungal-related mortality.

A retrospective chart analysis of adult patients undergoing treatment for AML/MDS and GVHD patients receiving immunosuppressive therapy between August 2012 and July 2017 will be conducted. Patient demographic, diagnostic and therapy information will be collected to characterize the primary and secondary endpoints. Data will be analyzed using descriptive statistics and appropriate statistical tests. This results of this study will evaluate the prophylactic strategy at our institution and add to the body of literature regarding alternative prophylactic strategies in this patient population.

Learning Objective:
Identify patients at high risk for invasive fungal infections and recommend an appropriate prophylactic strategy.
ACCELERATE TIME TO DISCHARGE: REAL-TIME STEWARDSHIP WITH RAPID DIAGNOSTIC TECHNOLOGY

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The purpose of this study is to determine if real-time Antimicrobial Stewardship Program (ASP) intervention with rapid pathogen identification technology, Accelerate Pheno™ Diagnostics (Accelerate), would make a significant difference in length of stay for the treatment of bacteremia.

Accelerate diagnostic technology can provide organism identification and susceptibility results eight hours after a blood culture turns positive. The primary outcome of this study is length of stay, secondary outcomes include time to optimal therapy, all-cause mortality, C. difficile rates, infection related readmission, and length of therapies.

This single center, randomized quality improvement project compared pre-and-post implementation of Accelerate. Post implementation was divided between intervention and non-intervention cohorts, which alternated weekly. Post implementation intervention cohort consisted of laboratory staff notifying ASP in real time as susceptibility and organism identification results become available between 0900 and 1700. Overnight results were reported to ASP at 0900. During the post implementation non-intervention weeks, regular laboratory workflow and routine ASP review of positive cultures occurred.

ASP activities and interventions are present in all three cohorts. This study will be powered to detect a 2-day reduction in length of stay, with a p-value of 0.0165. The results of the 3-month interim analysis will be presented. Outcomes should project impact of “real world” ASP with accelerated rapid diagnostic technology, as well as stewardship outcomes from technology alone.

Learning Objective:
Describe patient outcomes that may be effected by rapid diagnostic technology.

EVALUATION OF A DECENTRALIZED PHARMACIST’S ROLE ON AN INPATIENT MENTAL HEALTH UNIT AT A METRO COMMUNITY HOSPITAL

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Pharmacists working in a clinical role on an inpatient mental health unit can add significant value to the health care team and contribute to improved patient outcomes. This work is important, but there is no defined standardized process for how to best contribute to the mental health care team, and not all pharmacists feel comfortable working in this setting. This project aims to identify what staff psychiatrists and pharmacists at Mercy Hospital-Unity Campus desire from the mental health pharmacy shift and where there is opportunity for modification and education.

The main objective is to evaluate an inpatient mental health pharmacy shift and propose improvements by utilizing feedback provided by psychiatrists and pharmacists via a survey. As a secondary objective, competency documents and training materials will be formulated with the purpose of ensuring all staff pharmacists can confidently work on the inpatient mental health unit. The methods include obtaining Institutional Review Board approval, contacting staff psychiatrists and pharmacists via a survey, collecting data and comments, proposing potential improvements to the current shift, and developing competency documents based on the findings.

The changes proposed by the project will need to be evaluated in the future, and more roles for pharmacy in inpatient mental health could be identified, especially in regards to transitions of care. Therefore, by identifying ways in which pharmacists can better serve the mental health patients at Mercy Hospital-Unity Campus, there is potential for better relationships with psychiatrists and improved patient outcomes.

Learning Objective:
Identify opportunities for strengthening the role of a decentralized mental health pharmacist.
Hospital reimbursement rates from government and private payers are negatively impacted by patient readmissions, and medication-related issues remain a significant contributing factor. Hospital bedside medication delivery programs may be a way to combat readmission, as these programs provide needed medications and pharmacist consultation at point of discharge.

The purpose of this study is to assess the impact of a bedside medication delivery program on hospital readmission rates. The primary objective is to assess 30-day readmission rates for patients admitted with heart failure, acute myocardial infarction, chronic obstructive pulmonary disease, or pneumonia that utilized the hospital’s bedside medication delivery service, compared to overall hospital readmission rates for those same conditions. This institutional review board approved study will also evaluate: 90-day readmission rates, readmission reason, patients that received documented medication or disease state education by pharmacy personnel, and number of prescriptions filled.

Data for these objectives will be collected through retrospective chart review from randomly selected patients that received the service. Readmission rates from patients receiving bedside medication delivery will be compared against readmission rates from the Population Health group at CoxHealth for all hospitalized patients. The Chi-squared test or Fischer’s Exact test will be used to compare readmission rates.

The results of the study will be presented to hospital administration to determine if expansion of pharmacy transition of care services is justified.

Learning Objective:
Review the findings of a bedside medication delivery program on hospital readmission rates in patients with heart failure, pneumonia, acute myocardial infarction, and chronic obstructive pulmonary disease.
Chronic obstructive pulmonary disease (COPD) is the third leading cause of death in the United States. Pharmacologic therapy for COPD is used to reduce symptoms, reduce the frequency and severity of exacerbations, and improve exercise tolerance and health status. Due to the many different inhaler options, patients who are admitted who have COPD, may not have the same inhaled pharmacological therapy on their home medication list.

Therapeutic interchange is defined by the American Society of Health-System Pharmacists as, “an authorized exchange of therapeutic alternatives in accordance with previously established and approved written guidelines or protocols within a formulary system.” The effect that therapeutic interchanges for COPD medications has on therapeutic efficacy and cost efficacy is unknown.

The purpose of this study is to evaluate the impact of an automatic therapeutic formulary substitution of COPD inhalers through an approved therapeutic substitution policy on health outcomes in an acute care setting. The primary outcome will be 30-day readmission data, and the secondary outcome will be 30-day mortality and pharmacy cost.

These outcomes will be assessed through a retrospective review of the electronic medical records of patients who were discharged with the presence of COPD on their problem list at two hospitals that are similar in size and acuity within the same health-care system, one facility utilizes an automatic therapeutic formulary substitution policy, and one does not.

These results will be used to establish a therapeutic substitution policy for COPD inhalers at acute care facilities within a health system.

Learning Objective:
Review the effect of a therapeutic substitution on COPD inhalers on readmission, mortality, and pharmacy cost

Learning Objective:
Identify adverse outcomes of incorrect LAI antipsychotic dosing and how correct dosing can remedy these.
SAFETY AND EFFICACY OF DIRECT ORAL ANTICOAGULANTS POST-TRANSPLANT WITH CONCOMITANT CALCINEURIN INHIBITORS Katie McMurry, PharmD, Jerrica Shuster, K. Bennett Bain, Justin Hartupee

A significant proportion of transplant recipients require temporary or long-term systemic anticoagulation, mainly as a result of atrial fibrillation, deep venous thrombosis, or pulmonary embolism. The use of direct oral anticoagulants (DOACs) has not gained uniform acceptance in solid organ transplant (SOT) recipients due to lack of supportive data in patients receiving calcineurin inhibitors (CNIs). A few small single-center, retrospective studies have evaluated the use of DOACs post-transplant. The first study described 37 thoracic transplant recipients initiated on DOACs. The most common indication was venous thromboembolism (86.5%) and DOAC was rivaroxaban (78.4%). A subsequent study evaluated 27 heart transplant recipients and found more major bleeds in patients on the direct thrombin inhibitor, dabigatran versus anti-Xa inhibitors (2/9 v. 0/14, p= 0.065).

This is a single-center, retrospective, study of all SOT recipients ≥ 18 years old transplanted at Barnes-Jewish Hospital between 10/19/2010 – 06/01/2017. Transplant recipients prescribed CNI and first DOAC prescribed concurrently for ≥ 72 hours at any time post-transplant will be included. The primary objective is to evaluate the rates of bleeding events in SOT recipients on concurrent CNI and DOAC per each DOAC. Secondary outcomes will include incidence of thrombotic events on concurrent therapy, patient-specific CNI dose to concentration ratios after DOAC initiation, describe prescribing patterns of DOAC, evaluate appropriateness of DOAC dosing and identify bleeding predictors on concurrent therapy.

The pending results of this study will contribute to anticoagulation management in SOT recipients.

Learning Objective:
To evaluate safety and efficacy of direct oral anticoagulants in solid organ transplant recipients.
CHECKPOINT INHIBITOR TOXICITY MONITORING – ARE THE OLD WAYS STILL THE BEST WAYS?  

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While it has been clear for some time that the immune system plays a role in cancer suppression, the means to recruit a patient’s immune system to target cancer cells has only recently become available. A new class of drugs called checkpoint inhibitors help destroy cancer cells by limiting host-defense suppressing techniques by the cancer, allowing T-Cells to appropriately identify and destroy these tumor cells. However, with these new agents come increased risk for unique toxicities, particularly Immune-Related Adverse Events (irAE’s). These irAE’s can include every organ system but gastrointestinal, dermatologic, hepatic, and endocrine toxicities are the most common. Currently approved medications in this class include: atezolizumab, durvalumab, ipilimumab, nivolumab and pembrolizumab.

When monitoring patient’s for irAE’s, early recognition is critical. In many cases the damage from the hyper-immune response can be reversible, without permanent damage, if the toxicity is recognized and treatment is initiated. The creation of a standardized, electronic assessment tool could help with monitoring and identification of irAE’s in order to facilitate appropriate steps towards resolution.

The purpose of this project is to identify toxicities from these medications in order to develop an assessment tool that will be integrated into the electronic medical record. Toxicities will be identified from existing literature and from retrospective analysis of use in patients at a single-center, safety net Cancer Center. It is hoped that the early establishment of an assessment and monitoring tool could improve detection time of adverse reactions for current medications as well as similar medications currently in development in order to benefit patients and potentially reduce harm overall.

Learning Objective:
Recognize unique toxicity profiles related to checkpoint inhibitor immunotherapies.

CHARACTERIZATION OF EMERGENCY DEPARTMENT VISIT SECONDARY TO OPIOID-RELATED ADVERSE DRUG EVENTS IN THREE AGE-SPECIFIC GROUPS  

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According to the Centers for Disease Control, opioids continue to remain the standard of care for acute and chronic pain and their use among patients continues to increase. Numerous studies have correlated increased prescribing with accompanied increases in opioid related adverse events and hospitalizations. This study focuses on a particular source of opioid prescribing within the health system, the outpatient clinic setting, and retrospectively tracks them to an endpoint, the emergency department.

The purpose of this study is to determine the rate of emergency room visit secondary to opioid-related adverse drug event among three different age groups: 18 – 30, 31 – 64, and 65 or older. Within a Southwest Missouri hospital system, 44,374 patients received an opioid prescription from an outpatient clinic in 2016. Of this population, patients who received a prescription of at least 60 milligram morphine equivalents will be grouped into the above stated age groups. A randomly selected population of 50 patients per group will be chosen. A ratio will be reported for each group of patients who had an emergency room visit within 90 days of being prescribed an opioid.

Of the 150 patients randomized, there were 24 patients that had an emergency room visit within 90 days of being prescribed an opioid. The reasons for emergency room visit were various however none of the visits could be attributed to an opioid-related adverse drug event. This study did not identify any patients that had an emergency room visit secondary to an opioid-related adverse drug event within 90 days of being prescribed an opioid.

Learning Objective:
Describe the prevalence of emergency department visit secondary to an opioid-related adverse drug event at a Southwest Missouri hospital system.
Medications can pose a significant risk for falls, especially in the elderly, whose response to drugs acting on the central nervous system (CNS) may be significantly enhanced. It has been found that patients taking 3 or more standardized daily doses of CNS-acting medications were at almost twice the risk of fall compared to a matched cohort. A falls risk prediction tool has been designed by the University of Pittsburgh Claude D. Pepper Older Americans Independence Center for patients residing in skilled nursing facilities. This tool determines a summative fall prediction score through assessment of medications that are known to increase the fall risk for elderly patients.

The purpose of this project is to determine the applicability of this falls risk assessment tool in elderly patients within a sub-acute rehabilitation, as well as a general medicine, population. It is hoped that this data can help create an electronic predictive tool within the medical record that helps pharmacists prioritize clinical review of medications for those patients at increased fall risk and additionally alert other caregivers of this risk to better ensure patient safety overall. To accomplish this goal, a predictive tool will be used to score patients who reside on both a sub-acute rehabilitation unit and a general medicine floor. The scores will be used to directly compare patients who’ve suffered a fall and patients who have not during their admission.

This project has the potential to create an electronic medical record tool that can be incorporated into pharmacist workflow, in order to reduce fall risk through optimization of medication therapies.

Learning Objective:
Recognize those medication combinations that put our elderly patients at increased risk of falls.

According to the National Osteoporosis Foundation, osteoporosis is responsible for two million broken bones and $19 billion in related costs yearly. A 2010 health inspection report conducted by the Office of the Inspector General recognized men were less likely than women to be treated for osteoporosis following a fracture. Pharmacist-led multidisciplinary teams are associated with an increase in the initiation of osteoporosis medications in eligible patients.

The purpose of this quality improvement project is to evaluate the impact of pharmacist-led osteoporosis screening and management on patients identified through population health statistics. The primary outcome is the change in the percentage of veterans engaged in bone health management before and after implementation.

The VISN 15 Osteoporosis Dashboard was created to identify eligible veterans with or at risk for osteoporosis. Approximately 50 patients on a rural Patient Aligned Care Team (PACT) panel were identified at baseline in October 2017. Clinical pharmacists screened the identified patients and scheduled bone mineral density (BMD) testing and lab tests with the patient’s consent. Clinical pharmacists further evaluated the identified patients’ labs, calcium and vitamin D intake, BMD test results, and additional measures deemed necessary. If indicated, medication therapy was initiated by clinical pharmacists adhering to the National Osteoporosis Foundation (NOF) 2014 Guidelines and the Endocrine Society 2012 Osteoporosis in Men Guideline.

Results of this project will be used to optimize screening and treatment of osteoporosis and to expand the role of the PACT Clinical Pharmacist at the Kansas City VA.

Learning Objective:
To discuss the impact of clinical pharmacists in osteoporosis screening and bone health management.
FACTORS ASSOCIATED WITH INAPPROPRIATE PAIN MEDICATION ADMINISTRATION BASED ON PATIENT-REPORTED PAIN SCORES IN ACUTE CARE SETTINGS

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Considering the current opioid epidemic, pain medication use has become a focus of many health systems’ quality initiatives. Evaluations of dispensing patterns by regulatory bodies and healthcare systems have revealed that pain medication administration is often misaligned with the associated medication order and pain score. The objective of this study is to determine factors associated with the administration of pain medications that do not align with patient-reported pain scores to identify areas for improvement.

A stratified random sample of 10% was selected from patients admitted to 13 Midwest hospitals between 9/1/2017 and 9/30/2017. Sample frame included inpatients 18 years of age or older who received an opioid medication during hospitalization. Patients were excluded if they had fewer than three documented pain scores, had a cancer diagnosis associated with the treatment they were receiving, received continuous patient-controlled analgesia during hospitalization, or were in hospice. Sampling in facilities with 50 or more eligible patients was stratified by unit, with units with less than 5% of the institution’s eligible patient population combined prior to sampling. Data included patient characteristics; facility; inpatient unit; pain scores; analgesics-narcotic, NSAID, and non-narcotic analgesic medication orders and administration records; and naloxone use. Pain medication administrations were reviewed and classified as appropriate or inappropriate based upon the most recent patient-reported pain score. Potential factors contributing to each misaligned pain medication administration were recorded for an evaluation.

The results of the study will be used to identify potential areas for improvement to enhance the safety and efficacy of pain management.

Learning Objective:
Identify factors influencing pain management in an acute care setting

IMPLEMENTATION AND EVALUATION OF EXTENDED INFUSION PIPERACILLIN/TAZOBACTAM

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In 2013, the CDC reported that up to 50% of antibiotics prescribed for patients are not needed or are not optimally effective as prescribed. The way in which antibiotics are used is the single most important factor leading to antibiotic resistance. Infections due to antibiotic resistant organisms lead to decreased survival of patients, longer hospital stays, and increased healthcare costs. Currently, the number of new antibiotics being researched and developed is decreasing. Due to the lack of new agents, current therapy must be optimized in order to better patient outcomes. Piperacillin/tazobactam, a commonly used, broad spectrum antibiotic, is one such antibiotic that can be optimized to better patient outcomes and impeded resistance. Given the beneficial evidence of pharmacokinetic simulations and retrospective trials, SSM implementation of extended infusion piperacillin/tazobactam dosing is warranted.

The purpose of this study is to evaluate the extended infusion piperacillin/tazobactam dosing protocol after implementation in the St. Louis Region SSM Health Hospitals to validate its effect on patient outcomes. The primary outcome is in-house mortality and secondary outcomes are hospital length of stay, ICU length of stay, length of piperacillin/tazobactam treatment, and protocol adherence. Data will be collected via chart review from the records of SSM Health St. Louis region hospitals. The results of the study will be used to validate the implementation of extended infusion piperacillin/tazobactam dosing within SSM Health Hospitals.

Learning Objective:
Identify opportunities and processes to implement an extended infusion piperacillin/tazobactam dosing protocol.
EVALUATION OF TREATMENT DURATION IN PATIENTS WITH HOSPITAL ACQUIRED PNEUMONIA, HEALTH CARE ASSOCIATED PNEUMONIA, OR COMMUNITY ACQUIRED PNEUMONIA AT A COMMUNITY TEACHING HOSPITAL

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According to the current Infectious Disease Society of America/American Thoracic Society guidelines, it is best practice to treat pneumonias for the shortest duration. They recommend patients with non-complicated community-acquired pneumonia (CAP) be treated for a duration of five days and non-complicated patients with hospital-acquired pneumonia (HAP) be treated for a duration of seven days. Although guidelines have removed the term healthcare-associated pneumonia, our facility still classifies some patients as HCAP. A study conducted by Madaras-Kelly et al. showed that patients often receive a longer duration of therapy than recommended.

The purpose of this study is to compare the total duration of antibiotic therapy for pneumonia at our institution with the guideline recommendations. Patients will be included in the study if they were diagnosed with uncomplicated HAP, CAP, and HCAP and received antibiotic treatment for greater than 24 hours.

The objective will be assessed through retrospective review of patient records in the last twelve months. The data will be collected through a computer program and analyzed.

The results of this study will be used to help our facility to improve our antibiotic stewardship and patient outcomes.

Learning Objective:
Review the appropriate treatment duration of antibiotics for uncomplicated CAP, HAP, and HCAP.

EVALUATION OF A PHARMACIST CONSULT TO BETTER DIRECT MEDICATION ADMINISTRATION AROUND SCHEDULED HEMODIALYSIS

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There are more than 350,000 patients in the United States that receive hemodialysis treatments. These patients are generally chronically sick and on more medications than the average individual. Mercy hospital, a 250 bed community hospital, had just over 1,500 hemodialysis runs in the past year. The majority of these runs were planned with scheduled dialysis times. One of the largest areas of errors reported for hemodialysis patients is medication errors, and of those medication errors, the majority are errors of omission. Medication administration can be a difficult task in this patient population due to their continually fluctuating clinical picture and necessary planned and unplanned procedures. Nursing leaders have reported decreased staff satisfaction regarding the current medication process around hemodialysis and have requested extra resources.

The objective of this project is to create a sustainable pharmacy practice model via pharmacy consult service to address medication management around scheduled hemodialysis in a proactive manner. Assessing the current state of practice for areas of improvement and piloting new workflow and communication between nurses and pharmacists regarding medication management in our hemodialysis patient population is the goal. Standardized resources for pharmacy staff as well as communication templates will also be developed throughout this process.

The results of this project will be used to implement changes regarding the current workflow around scheduled hemodialysis at Mercy Hospital and potentially system-wide.

Learning Objective:
Identify the most common type of medication error around hemodialysis.
Chemotherapy-induced nausea and vomiting (CINV) is considered one of the most feared toxicities by patients of cancer treatment. CINV can occur in up to 80% of patients receiving treatment, and these symptoms are associated with a deterioration in quality of life. Even with an optimized anti-emetic strategy symptoms of CINV may still occur. Current guidelines recommend a variety of treatments for CINV when prophylaxis strategies have failed. Olanzapine is an atypical antipsychotic agent blocking many neurotransmitters involved in the nausea and vomiting pathophysiology. While olanzapine has recently been recognized in some oncology supportive care guidelines, the number of studies regarding its use is small and data in patients undergoing HSCT is lacking.

The primary objective of this study is to determine if olanzapine is associated with improved delayed and breakthrough nausea and vomiting in patients undergoing HSCT. Secondary outcomes include the number of documented emesis episodes after the first dose of olanzapine, patient oral intake after the first dose of olanzapine, and number of rescue antiemetic agents administered after the first dose of olanzapine. This retrospective cohort review will examine the effects of using olanzapine for the treatment of breakthrough nausea and vomiting following autologous or allogeneic HSCT between January 2014 and October 2017. Information collected from patient medical records will include demographic, laboratory, and therapy information. Variables will be analyzed using appropriate statistical tests.

This research will provide evidence based justification of the utilization of olanzapine as a rescue antiemetic in stem cell transplant patients at Nebraska Medicine.

Learning Objective:
Describe the utility of olanzapine for improved delayed and breakthrough nausea and vomiting in patients undergoing hematopoietic stem cell transplant.

Antimicrobial treatment of asymptomatic bacteriuria is a common occurrence. The Infectious Diseases Society of America (IDSA) Guidelines only recommend antimicrobial therapy in two patient populations – pregnant women and those undergoing invasive urologic procedures. Despite these recommendations, many patients who do not fall into these categories are treated with antibiotics without any symptoms of infection. Risks associated with unnecessary use of antibiotics include antibiotic resistance, C. difficile infection, and adverse effects.

The purpose of this study is to identify risk factors for the treatment of asymptomatic bacteriuria. A retrospective case control study will be performed on patients with a urinalysis or urine culture ordered between August 23, 2017 and October 23, 2017. Patients will be excluded if genitourinary symptoms are documented in the medical record, a patient is pregnant or undergoing a urologic procedure. Patients treated for asymptomatic bacteriuria will be compared to untreated patients to determine risk factors for treatment. Descriptive and bivariate analyses will be performed when appropriate.

The results of this study will be used to educate medical staff on which patients are at risk for treatment. This information may also be used to improve antimicrobial stewardship practices, resulting in reduced antibiotic utilization, resistance and cost.

Learning Objective:
Identify patients that may benefit from the treatment of asymptomatic bacteriuria.
Respiratory tract infections are a major cause of hospitalizations. While viruses and bacteria are both potential causes, difficulty in differentiation of pathogens often brings clinicians to empirically start antibiotics. This can lead to unnecessary antibiotic exposure. Rapid diagnostics are available, however. Procalcitonin has been shown to be specific for bacterial infections, particularly those of respiratory nature. The FilmArray viral polymerase chain reaction (PCR) assay can quickly test for many viral respiratory pathogens. Our goal is to evaluate whether these rapid diagnostic tools can be used to reduce antimicrobial use via a clinician directed EMR alert.

The diagnostic tool to be used is the FilmArray Respiratory Panel, a multiplex PCR test. This test detects 17 common respiratory viruses, as well as 3 bacteria. The EMR alert will fire for clinicians when a patient has a procalcitonin less than 0.25 µg/ml, a positive viral PCR result, and at least one active antibiotic order. It will prompt them to re-evaluate the necessity of antibiotic therapy given the presence of rapid diagnostics suggestive of viral infection. The purpose of the study is to reduce inappropriate antibiotic usage.

This is a prospective, non-randomized study with a retrospective control. It involves review of two groups of patients from before and after implementation of the EMR alert. The prospective group includes those whom the alert will fire for, and the retrospective group those who were treated before the alert is implemented, but met criteria for firing. To assess the study, days of antibiotic therapy will be compared.

**Learning Objective:**
Describe the combined usage of procalcitonin, respiratory PCR, and EMR anti-microbial stewardship to reduce antibiotic usage in patients with likely viral infection.

In May 2016, the FDA advised restricting fluoroquinolone antibiotics for use in acute bronchitis, acute bacterial rhinosinusitis (ABRS) and acute cystitis as the side effect profile of fluoroquinolones outweighs the benefits of treatment. Additionally, fluoroquinolones are frequently prescribed for acute chronic obstructive pulmonary disease (COPD). The primary objective of this study was to review outpatient prescribing patterns of fluoroquinolones, implement changes at our institution to change prescribing patterns, and decrease fluoroquinolone use in the treatment of these conditions.

A retrospective chart review was performed on 109 patients who received a fluoroquinolone antibiotic for the treatment of acute bronchitis (n=39), COPD exacerbation (n=32), acute sinusitis (n=18) and acute cystitis (n=10) from October to December 2017 in our Veterans Affairs outpatient clinics. Data was analyzed by a clinical pharmacist for appropriate use of fluoroquinolones. Overall, 57.8 percent (n=63) of prescriptions were deemed inappropriate. Specifically, 44.4 percent (n=8) ABRS, 97.4 percent (n=38) acute bronchitis, 60 percent (n=6) acute cystitis and 31.3 percent (n=10) acute COPD exacerbation were prescribed inappropriately. Opportunities for improvement have been identified. Additional education will be given to providers regarding potential adverse effects associated with fluoroquinolones. Antibiotic prescribing guidance will be distributed to both pharmacists and prescribers. A pharmacist-driven active intervention process will be implemented within pharmacy order verification to ensure appropriate use of fluoroquinolones. A post-data collection will be completed to evaluate effectiveness of the interventions.

**Learning Objectives:**
List the indications for which the FDA recommends against the use of fluoroquinolones due to risks associated with therapy outweighing benefits.
Discuss possible pharmacist interventions to improve prescribing patterns of fluoroquinolones.
Mechanically ventilated patients are critically ill and likely will experience pain, agitation and/or delirium while in the intensive care unit. Guidelines have established the benefits of practicing daily spontaneous breathing trials, lighter sedation, reducing use of benzodiazepines, and analgesia first methods. There are currently no widely accepted sedation protocols for managing mechanically ventilated patients. Therefore, there is a specific need to find an easy to use, evidence based protocol to improve patient outcomes.

This study will seek to determine if the use of flowchart-directed sedation vacation and titration protocols will reduce the number of ventilator days, length of intensive care stay and amount of sedatives used. Secondary endpoints will be percent protocol compliance, RASS goal attainment rate, and percent sedation order set usage.

This will be a retrospective comparison cohort trial assessing patient outcomes when the sedation protocols have high adherence versus low adherence. The electronic health record will be used to evaluate each documented sedation score to determine if the corresponding action follows the protocol directive. Patients will be split into quartiles for statistical analysis based on staff compliance with the protocol. Quantification of individual sedatives will include opioids focusing on fentanyl, dexmedetomidine, propofol, benzodiazepines and antipsychotics focusing on haloperidol.

The results of this study will be used to re-educate hospital staff regarding the protocol’s benefit with the intent to improve patient care. Additionally, the protocol will be shared as a tool to be utilized by other facilities for improvements in their sedation vacation and titration protocols.

Learning Objective:
Describe the clinical outcomes associated with employing a standardized sedation vacation and titration protocol

Antimicrobial stewardship programs play an important role in ensuring appropriate use of antibiotics in healthcare settings. The Infectious Diseases Society of America (IDSA) supports implementation of Antimicrobial Stewardship Programs in all healthcare settings. The New Antimicrobial Stewardship Standard from the Joint Commission requires hospitals to have an Antimicrobial Stewardship Program in place. Antimicrobial stewardship aims to optimize antibiotic utilization, which includes: correct antibiotic, correct dose, duration of therapy, and route of administration. The goal of making these interventions is to minimize toxicity, reduce healthcare costs related to treating infections, and combat antimicrobial resistance.

The primary objective of this quality improvement project is to assess the amount of time pharmacists spend reviewing patients using the antimicrobial stewardship module in Epic®. Secondary objectives are to assess the amount of recommendations made by pharmacy, the acceptance rates of recommendations made, time spent with the Infectious Disease Physician, and a cost savings analysis.

To assess these objectives, pharmacists will be using the antimicrobial stewardship module in Epic® to review appropriate antibiotic use in patients during a five-week period (December 2017 - January 2018). Descriptive statistics will be calculated to report findings.

The results of the study will be used to determine how to operationalize and justify expanding pharmacy antimicrobial stewardship services at St. Cloud Hospital.

Learning Objective:
Identify resources necessary to expand antimicrobial stewardship pharmacy services at St. Cloud Hospital.
IMPLEMENTATION OF A NURSE-LED PROTOCOL FOR INITIATION AND TITRATION OF METFORMIN THERAPY IN TYPE-2 DIABETES PATIENTS Jillian Murphy, Lisa Bilslend, Shayla Bigley, VA Nebraska-Western Iowa Health Care System, 2201 N Broadwell Ave, Grand Island, NE 68803. jillian.murphy@va.gov

At VA Nebraska-Western Iowa Heathcare System (NWIHCS) Grand Island, a Nursing Metformin Protocol (NMP) was implemented for the upward-titration of metformin.

The primary objective was to analyze the number of patients referred to nursing for the initiation of metformin and compare the referrals from pharmacy versus providers. Secondary objectives were to determine the number of patients started on metformin, those requiring metformin SA, percentage reaching goal dose, and number followed as recommended by nursing protocol.

Patients were referred to nursing via EMR by prescribing provider. Registered nurses used “Nursing Metformin Titration” template in EMR, titrated patients using four metformin dose levels, and reassessed weekly. Data was collected via chart review, analyzing all patients who had documentation using the note template from May through November 2017. Information assessed included: referral source, starting and ending A1c, other diabetes medications, history of metformin IR, number of nursing notes written, adverse drug effects, and final metformin dose.

Thirteen patients were referred to nursing and started on metformin; all referred by pharmacy. Of those referred to the NMP, 54% of patients reached goal dose of 2000mg daily. The SA formulation was initially started in 69%; 0% switched to SA per protocol. Nursing followed up 85% as per protocol; average number of nursing notes was 4.4. Average A1c reduction for the eight patients analyzed was 1.3%. Further education is necessary to increase participation of primary care providers. The NMP is successful at the Grand Island VA and can now be introduced at the other NWIHCS sites.

Learning Objectives:
Describe the use of the Nursing Metformin Protocol at VA Nebraska-Western Iowa Health Care System-Grand Island.

DEVELOPMENT OF A MERIT-BASED INCENTIVE PAYMENT SYSTEM AND QUALITY FOCUSED AMBULATORY CARE PHARMACY PRACTICE MODEL AT A TERTIARY REFERRAL MEDICAL CENTER Emily Murray, Annette Johnson, Glenn Voss, Avera McKennan, 1325 S Cliff Ave, PO Box 5045, Sioux Falls, SD 57117. emily.murray@avera.org

In the rapidly-evolving healthcare scene, meeting key quality metrics is beneficial not only for optimal outcomes for the patients we serve but also for the sustainability of our health care systems. The purpose of this study is to develop an ambulatory care pharmacy practice model focused on merit-based incentive payment systems (MIPS) and quality in the realm of chronic disease management.

The basis for this practice model development is drawn from observations made through the completion of a needs analysis. The data for this analysis was pulled from our institution’s affordable care organizations (ACOs). The goal of the needs analysis was to determine what factors are driving patients to be high utilizers of healthcare resources. Special attention was paid to medications with highest total patient spend, provider groups with highest patient risk scores and provider groups with highest number of emergency room visits and inpatient admits.

Data from this analysis has prompted our efforts to focus on improving care delivered to patients with diabetes mellitus, chronic obstructive pulmonary disorder and congestive heart failure. Note templates will be developed that integrate key MIPS metrics into each patient visit driving the ambulatory care pharmacist to provide quality care to the patient while improving the health system’s progression in meeting these metrics. As the note templates are integrated into practice, a dashboard will be developed to track changes in MIPS scores for each practice site with an ambulatory care pharmacist.

Learning Objective:
Describe performance-based payment adjustments to reimbursements.
EVALUATION OF PROCALCITONIN LEVELS AND ANTIBIOTIC UTILIZATION PRE- AND POST- IMPLEMENTATION OF PHARMACIST PROVIDED INTERVENTIONS  
Kiera Murray, Erin Lockard, Covenant Medical Center 3421 W 9th St, Waterloo, IA 50702  
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Currently procalcitonin levels are drawn for suspected lower respiratory tract pneumonia and sepsis but levels are not always reordered and followed. Studies have shown that if procalcitonin levels are less than 0.25 mcg/l a bacterial infection is unlikely with a lower respiratory tract infection and very unlikely with sepsis. This study is hypothesizing that pharmacist ordered and monitored procalcitonin levels and provided education will result in an increase in appropriate use and duration of antibiotics attributable to procalcitonin levels.

The target population will be all the patients admitted and having procalcitonin levels drawn retrospectively from June 1st 2017 to August 1st 2017 and then patients admitted with sepsis or pneumonia prospectively November 1st, 2017 to January 31st, 2018. Upon chart review and data collection in the Electronic Medical Record, the researchers will analyze the data collected in an attempt to identify associations between: procalcitonin levels, percent change in procalcitonin from baseline, number of procalcitonin levels measured, days of antibiotic use, number of doses of antibiotics received, length of hospital stay, and indication for procalcitonin monitoring (pneumonia or sepsis). Additionally, the prospective part of this project will analyze pharmacist ordered first or repeat procalcitonin levels and the percent of recommendations accepted by physicians. The projected cost savings of antibiotics used and length of stay will be compared between the two groups.

The study period has ended and data is still being analyzed but it appears that the prospective group may have shorter lengths of stay with less antibiotics.

Learning Objective:
Recognize why procalcitonin levels are valuable for antimicrobial stewardship and determine when it may be appropriate to deescalate or discontinue antibiotics.

IMPLEMENTATION OF A PHARMACY DIABETES MANAGEMENT SYSTEM TO REDUCE INCIDENCE OF HYPOGLYCEMIA  
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As a significant number of hospitalized patients are admitted with Type 1 or Type 2 diabetes, controlling blood glucose in hospitalized diabetic patients remains a complex task. While the ADA guidelines have implemented parameters to help control blood sugars and minimize hyperglycemia, hypoglycemia has also been a significant problem which is associated with increased cost, length of stay, morbidity, and mortality. Cass Regional Medical Center is a 35 bed hospital which has had a considerable number of hypoglycemic episodes, with 14 reported incidences in January 2018. With the inpatient hospitalist physicians, a diabetes educator, and the pharmacy department, the hospital seeks to implement new measures to track risk factors, and reduce hypoglycemic incidences.

The purpose of this study is to determine whether certain interventions will reduce the incidence of hypoglycemia in Type 1 and Type 2 diabetes admitted to inpatient care. First, pharmacy implement the discontinuation of sulfonylureas while inpatient, and then a pharmacy can be consulted for management of patients who will be on oral diabetic agents and/or insulin.

These objectives will be measured by calculating the incidence of hypoglycemia events within admitted Type 1 and Type 2 diabetic patients who are on insulin and/or oral diabetic medications. A second objective will measure levels of satisfaction from physicians and a diabetes educator with the pharmacy team’s suggestions.

The results of the study will be used to implement changes in Cass Regional Medical Center to reduce incidences of hypoglycemia and improve overall patient safety.

Learning Objective:
To identify interventions pharmacy can make in reducing incidences of inpatient hypoglycemiam.
KNOWLEDGE IS HEART POWER: IMPROVING HEART FAILURE TRANSITIONS OF CARE THROUGH PHARMACY LED DISCHARGE MEDICATION EDUCATION Megan Nelson, Ross Fishman, Jena Torpin, Brittany Hawke, Mercy Hospital, 4050 Coon Rapids Boulevard NW, Coon Rapids, MN 55433. Megan.Nelson@allina.com

Despite advances in medical therapy, heart failure remains one of the leading causes of hospital readmissions. While there are many factors that influence readmission rates, medication adherence is a well-accepted factor. Like readmissions, medication adherence is multifactorial, but it is believed that education plays a key role. There is growing evidence to suggest pharmacy led education sessions may lead to fewer adverse drug reactions, decreased emergency department visits, improved patient satisfaction, and overall cost savings. While pharmacy led discharge education is not widely implemented, there is potential benefit to heart failure patients.

The main objective of this project is to enhance heart failure patients’ understanding of medications. This study has been designed to assess each patient’s baseline knowledge of their medications, allow pharmacists to provide guideline supported education, and evaluate the success of provided education utilizing the teach-back method. It is believed by providing education and reviewing understanding patients will have the power to take better charge of their health and potentially stay out of the hospital.

Learning Objective:
Describe the effect of pharmacist led medication education on heart failure patients’ understanding.

IMPACT OF PHARMACIST-LED MANAGEMENT OF TYPE 2 DIABETES IN VETERANS ON INTENSIVE INSULIN REGIMENS IN AN OUTPATIENT CLINIC SETTING Vivian Nguyen, Sarah Will, Janelle Vittetoe, Patrick Spoutz. KCVA, 4801 E. Linwood Blvd, Kansas City, MO 64128. Vivian.Nguyen6@va.gov

Current treatment guidelines recommend initiation and titration of insulin in Type 2 Diabetes when hyperglycemia persists despite oral medication optimization. "Over-basalization," or insulin titration past 50% of a total daily basal insulin dose or total daily dose of combined insulins exceeding 1.5 units/kg/day, is observed when targeting glycemic control and is associated with weight gain, injection burden and hypoglycemia. Newer anti-hyperglycemic medications and medications with insulin-sensitizing properties are associated with reducing hemoglobin A1c (HbA1c), weight, insulin dose, and blood pressure when added to intensive insulin regimens. There is limited evidence delineating the outcomes of pharmacists’ interventions in obese patients with Type 2 Diabetes on "over-basalized" or intensive insulin regimens.

The purpose of this project is to identify alternative pharmacotherapy strategies that may improve glycemic control and decrease adverse reactions related to continued insulin titration. Pharmacist-directed clinics were reviewed to identify obese patients on ≥45 units of basal insulin or ≥ 90 units of combined basal/bolus insulin per day obtaining primary care services at the Kansas City VA Medical Center (KCVAMC). Primary outcomes include HbA1c% change and proportion of patients meeting HbA1c% goals. Additionally, types of interventions and change in weight, blood pressure, and insulin dose will be evaluated. Data will be collected through electronic chart review and will be depicted using descriptive statistics.

Results of this project will be used to provide additional evidence to support using alternative Type 2 Diabetes medication management strategies within KCVAMC primary care services.

Learning Objective:
Identify potential adverse drug reactions associated with intensive insulin regimens.
**EFFECT OF TARGETED PROVIDER EDUCATION ON ANTIBIOTIC PRESCRIBING IN AN OUTPATIENT SETTING**

Melissa C. Norton, Lyndsey N. Hogg, Meghan Haftman, Todd Schroeder, Via Christi Hospitals Wichita, Inc., 929 N St Francis St, Wichita, KS 67214. melissa.norton@ascension.org

The CDC released the Core Elements of Outpatient Antibiotic Stewardship in an effort to measure and improve how antibiotics are prescribed by clinicians and used by patients. One of the core elements includes providing education and expertise in the outpatient setting. Guideline-based education was provided at Via Christi Clinic to prescribers in an effort to satisfy the education and expertise core element.

The purpose of this study is to evaluate the effect of targeted provider education on the rate of inappropriate antibiotic prescriptions in an outpatient setting.

This retrospective chart review has received Institutional Review Board approval. The primary objective is to evaluate the change in the rate of inappropriately prescribed antibiotics following targeted provider education. Education was provided in four clinic locations in September 2017. Data was collected from outpatient electronic prescription records from patients that were prescribed antibiotics between the pre-education dates of October 1, 2016 to December 31, 2016 and the post-education dates of October 1, 2017 to December 31, 2017. Targeted conditions include sinusitis, pharyngitis, acute otitis media, and uncomplicated urinary tract infections based on diagnosis codes with definitions of antibiotic appropriateness for each condition. Secondary objectives include a comparison in percentage of inappropriately prescribed antibiotics between clinic locations, percentage of patients prescribed an additional antibiotic prescription within 30 days for the same targeted condition, and changes in antibiotic therapy following urinary cultures results.

The results of the study will be used to develop provider education and improve antimicrobial stewardship efforts in the outpatient setting.

**Learning Objective:**

Explain the impact of pharmacist-led provider education in outpatient antimicrobial stewardship

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**MEDICAL CANNABIS: EFFECTS ON OPIOID AND BENZODIAZEPINE REQUIREMENTS FOR PAIN CONTROL**

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There is currently very little evidence regarding the use of medical cannabis for the treatment of intractable pain, particularly within the specifics of the Minnesota Medical Cannabis Program. The purpose of this study is to determine whether patients enrolled in the medical cannabis program for treatment of intractable pain in Minnesota have experienced a reduction in dosage of opioids and benzodiazepines for daily pain control. The information obtained from this project will address some of the current research gaps regarding the use of medical cannabis for intractable pain.

This retrospective study will review charts of nearly 250 certified patients using medical cannabis for the qualifying medical condition of intractable pain. The study will evaluate if the dosage of opioids and/or benzodiazepines required at baseline decreased with the initiation of medical cannabis. To determine this, total morphine milligram equivalents (MME) and diazepam equivalents will be calculated at baseline, 3 months, and 6 months and trended.

The outcomes of this project are intended to aid providers in determination of their prescribing practices and improve outcomes for patients. Currently there is very little data guiding the use of medical cannabis. Given the high percentage of Minnesota patients using Medical Cannabis for pain control, the importance of further research cannot be overstated.

**Learning Objective:**

Discuss the effects of medical cannabis on opioid and benzodiazepine dosage requirements for pain control
Pharmacists at a community hospital currently utilize paper documentation for vancomycin pharmacokinetic services. Performing pharmacists' clinical activities via paper-based documentation is passive, prone to follow-up omission and transcription errors thus diminishing patient safety and productivity. An electronic surveillance system is proposed to improve monitoring clinical activities, providing timely alerts and the ability for pharmacist to pharmacist communication. The purpose of this project is to determine if TheraDoc can replace current paper documentation known as “Blue-Sheets” and maintain the quality of the pharmacy provided pharmacokinetic service.

This is a retrospective quality assurance study. Success of pharmacy provided kinetic service is defined by pharmacists entering pharmacokinetic consults within eight hours of the physician order in both TheraDoc and MediTech, response to troughs within 4 hours, and daily entries of patient clinical events into TheraDoc. The pharmacy has planned to replace the Blue-Sheets with TheraDoc starting October 27, 2017. Data collection will target vancomycin consults from November 1, 2017 to December 1, 2017. The inclusion criteria are all consecutive patients having a pharmacy consult for vancomycin dosing with at least one trough result.

The primary endpoint of this project is to determine the number of vancomycin pharmacokinetic consultations lost to follow up when using electronic versus paper documentation.

Learning objective:
Discuss the advantages and disadvantages of electronic versus paper documentation of vancomycin pharmacokinetic services.
IMPLEMENTING VANCOMYCIN AUC DOSING IN A CRITICAL ACCESS HOSPITAL  
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Vancomycin has been used since the 1950s, and throughout the course of its usage, its dosing has undergone multiple changes. Currently, most hospitals use trough levels to monitor therapy, but recent data have suggested a superior modality is AUC:MIC. This has not only been associated with better kill rates, but also with a lower incidence of nephrotoxicity. However, accurately calculating AUC:MIC requires more complex calculations, along with additional lab draws.

Switching to this modality can be especially burdensome in a small, critical access hospital. Short hospital admissions can lead to a vancomycin level being drawn, then the patient discharging or transferring without seeing any benefit from the additional blood draw. Small hospital size confers a smaller formulary, reducing the feasibility of specific doses. Our hospital also uses an off-site pharmacy service afterhours, requiring any solution to be manageable remotely.

With all of these considerations in mind, our hospital decided to create a vancomycin dosing calculator, which can be shared with our remote pharmacy service. It evaluates potential dosing regimens and creates suggestions based on certain variables, and it allows pharmacists to fine tune these regimens as needed. To address concerns of vancomycin levels being drawn on patients that quickly discharge, the levels will not be drawn until after the first dose as an inpatient, rather than including emergency department patients. By implementing these changes, the hospital aims to reduce the rates of nephrotoxicity, while avoiding unjustifiable costs.

Learning Objective:
Identify potential barriers critical access hospitals may face when attempting to switch to AUC-based vancomycin dosing from traditional trough-based dosing.

EFFECT OF LOWERING PROPOFOL TITRATION LIMITS ON PROPOFOL USE AND SEDATION OUTCOMES  
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National sedation guidelines recommend administration of sedative agents at minimal dosages necessary to achieve desired sedation levels. A 2016 survey of the St. Cloud Hospital Intensive Care Unit (ICU) showed sedation to be deeper than preferred in mechanically-ventilated patients. It was hypothesized this finding may be due to propofol titration practices. Consequently, the default maximum titration limit of propofol infusions was changed from 80 mcg/kg/minute to 50 mcg/kg/minute.

The primary objective of this study is to assess if decreasing the default titration limit of propofol infusions for adult ICU mechanically-ventilated patients altered the average dose of propofol received in the first 96 hours following infusion initiation. Secondary objectives compared include: RASS scores, duration of mechanical ventilation, number of unplanned extubations, the use of other sedative, analgesic, and paralytics infusions, and the occurrence of hypertriglyceridemia.

This pre-vs-post, retrospective review will compare patients admitted to the ICU prior to the propofol titration limit change (March 2016 to August 2016) to patients admitted to the ICU after the change (March 2017 to August 2017), separated by a 6-month run-in period. Patients will be included if they were mechanically-ventilated and receiving propofol for at least 18 hours. The first 100 patients that meet criteria will be included in each group (desired n = 200).

The results of the study may be used to justify the continued use of a lower default titration limit or reinstatement of a higher default propofol titration limit.

Learning Objective:
Indicate the effect of lowering the default propofol titration limit on propofol use at St. Cloud Hospital
EVALUATION OF FLUOROQUINOLONE USE FOR URINARY TRACT INFECTIONS IN THE EMERGENCY DEPARTMENT AFTER PHARMACIST LED EDUCATION  Janessa Paden, Shelley Crooks, Sara Mills, Stephanie Lager, Katie Stumpff, Mosaic Life Care, 5325 Faraon St, Saint Joseph, MO 64506. janessa.padens@mymlc.com

Fluoroquinolone resistance rates have increased significantly in urinary tract infections (UTIs). Specifically, a study published in 2016 reported increased ciprofloxacin resistance for E. coli from 3.36% in 2003 to 11.8% in 2012. Education to providers on appropriate empiric therapy for UTIs based on guideline recommendations and local resistance patterns can aid in appropriate empiric antibiotic selection at time of diagnosis.

The purpose of this study is to evaluate the impact of pharmacist led education on emergency department fluoroquinolone prescribing habits. Specific habits analyzed will include percentage of patients diagnosed with a UTI who were prescribed a fluoroquinolone antibiotic empirically and the incidence of fluoroquinolones prescribed for asymptomatic bacteriuria.

These objectives will be assessed through evaluation of fluoroquinolone prescribing for patients diagnosed with symptomatic and asymptomatic UTIs before and after pharmacist led education. Secondary endpoint will include appropriate dosing of antibiotic by indication and renal function. Statistical analysis will be performed on data collected.

Data will be obtained from the electronic medical record from 15 December 2017 to 16 March 2018 after education is provided and compared to historical control from 1 June 2017 through 30 August 2017. Patients 18 years and older will be included in our analysis if they were diagnosed with a UTI and treated with an antibiotic upon discharge from the emergency department.

The results of the study will be used to implement changes in empiric prescribing of antibiotics for UTIs in the emergency department based on local resistance patterns and to improve patient care.

Learning Objective:
Recognize increases in fluoroquinolone resistance rates and how to apply to empiric antibiotic prescribing for urinary tract infections in the Emergency Department

TRIPLE SITE INTERVENTION FOR MRSA DECOLONIZATION IN A VETERAN COMMUNITY LIVING CENTER  K. Taylor Parks, Andrea Aylward, Veronica Soler, Jessica O’Brien, Sioux Falls Veterans Affairs Health Care System, 2501 West 22nd Street, Office B95, Sioux Falls, SD 57117. kaitlyn.parks@va.gov

Methicillin-resistant Staphylococcus aureus (MRSA) is a major cause of infections. Patients may be colonized with MRSA, serving as a reservoir for transmission to other patients or health care workers. This is of utmost concern in long-term care facilities, such as veteran Community Living Centers (CLC), where isolation precautions to prevent transmission may be socially isolating.

Currently, not all MRSA positive patients are routinely decolonized. Additionally, the optimal regimen for eradication is uncertain. Guidelines recommend regimens that include oral antimicrobials; however, systemic agents are associated with adverse effects and antibiotic resistance. Evidence has shown that mupirocin nasal ointment and chlorhexidine body solution are effective components of a decolonization regimen; however, the effectiveness of these products in addition to chlorhexidine oral rinse has never been evaluated.

The purpose of this study is to determine the efficacy of a triple site intervention including mupirocin nasal ointment, chlorhexidine body solution, and chlorhexidine oral rinse for MRSA decolonization, and to discover if this intervention is cost effective.

These objectives will be assessed by a retrospective chart review from January 1, 2007 to August 31, 2017 comparing MRSA colonized patients who received the intervention to patients who did not. Descriptive statistics will be used to compare baseline characteristics and average daily costs. An odds ratio will be calculated to compare rates of MRSA decolonization.

The results of the study will be used to provide insight on whether this regimen is a beneficial intervention for MRSA colonized veterans in a CLC setting.

Learning Objective:
Discuss the efficacy of a triple site intervention method, including mupirocin nasal ointment, chlorhexidine body solution, and chlorhexidine oral rinse, for the eradication of MRSA colonization in a veteran Community Living Center
COMPARISON OF THE RATES OF SUPRATHERAPEUTIC ANTI-XA LEVELS IN PATIENTS RECEIVING THERAPEUTIC ENOXAPARIN WITH NORMAL RENAL FUNCTION OR MODERATE RENAL IMPAIRMENT Carolyn L. Parr, Diana R. Langworthy. 500 SE Harvard St, Minneapolis, MN 55455. cparr2@fairview.org

Enoxaparin is a low-molecular weight heparin used for the treatment and prophylaxis of thromboembolic events. Due to its renal elimination, the manufacturer recommends dose adjustment of enoxaparin at a creatinine clearance of 30 mL/min or less in order to decrease the risk of supratherapeutic anti-Xa levels and subsequent bleeding events. Although there are clear dosing recommendations for patients with significantly diminished renal function, there is little data in the available literature to guide dosing in patients with moderate renal impairment of 30-59 mL/min.

The present study will utilize a retrospective medical record review including adult inpatients with moderate renal impairment (30-59 mL/min) or normal renal function (90 mL/min or greater) receiving therapeutic enoxaparin for any indication between January 2011 and September 2017. The primary objective is to compare rates of supratherapeutic anti-Xa levels in patients with moderate renal impairment to patients with normal renal function. Comparison of the rates of major and minor bleeding events between groups is the secondary objective of this study.

It is expected that patients with moderate renal impairment will be more likely to experience supratherapeutic anti-Xa levels compared to patients with normal renal function and that there will be a greater rate of major and minor bleed in patients with moderate renal impairment compared to patients with normal renal function. Results of the study may be used to guide future research efforts in this area.

Learning Objective:
Compare rates of supratherapeutic anti-Xa levels, major bleeding events, and minor bleeding events in patients with moderate renal impairment.

MULTI-CENTER STUDY OF CLINICAL OUTCOMES ASSOCIATED WITH THE USE OF NOVEL ORAL ANTICOAGULANTS VERSUS ASPIRIN IN POST-OPERATIVE ORTHOPEDIC PATIENTS Pooja Patel, Sarah Lessard, Ross Dierkhising, Rachel Arfstrom, Mayo Clinic Health System-Franciscan Healthcare, 700 West Ave S, La Crosse, WI 54601. patel.pooja2@mayo.edu

Patients who undergo major orthopedic surgery have a higher risk of developing venous thromboembolism which includes deep vein thrombosis and pulmonary embolism. Venous thromboembolism can cause hospital readmissions, increase in mortality, morbidity and fiscal burden for the patient. The American College of Chest Physicians recommends low molecular weight heparin, warfarin, fondaparinux, aspirin and novel oral anticoagulants as prophylactic agents when compared to no prophylaxis. In contrast, previous guidelines by the American Academy of Orthopedic Surgeons did not recommend any specific pharmacologic agent. An update in 2012 led to an agreement between the two groups to use aspirin as a potential prophylaxis agent. This recommendation was based on overall poor quality of evidence, prompting institutional concern over comparative efficacy of the various options for prophylaxis. The purpose of this study is to compare clinical outcomes associated with the use of novel oral anticoagulants or aspirin in post-operative orthopedic patients.

This is a multi-center retrospective cohort study of patients who underwent either a total hip or a total knee arthroplasty between June 1, 2012 and June 1, 2017. Efficacy of thromboprophylaxis with either aspirin or a novel oral anticoagulant (apixaban, dabigatran, or rivaroxaban) was compared utilizing a primary composite endpoint of symptomatic deep vein thrombosis, non-fatal pulmonary embolism, and all-cause mortality within 30 days of surgery. It is anticipated that patients who received a novel oral anticoagulant will have a lower incidence of the primary outcome compared to patients who received aspirin.

Learning Objective:
Identify four pharmacotherapeutic options for DVT prophylaxis in post-operative orthopedic patients.
Correlative Effects of 3% Sodium Chloride Continuous Infusion on Intracranial Pressure for Patients with Traumatic Brain Injury or Intracranial Hemorrhage: An Evaluative Retrospective Study

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Hypertonic saline (HTS) is used to assist in management of elevated intracranial pressure (ICP) due to traumatic brain injury (TBI) and intracranial hemorrhage (ICH). Patients who suffer from severe TBI or ICH may require treatment to reduce further brain damage via ICP control. Efficacy of 23.4% sodium chloride bolus doses in reducing ICP is supported by many studies. However, little supportive evidence exists for application of continuous infusion 3% HTS for ICP management.

The purpose of this retrospective study is to evaluate the correlation of continuous infusion 3% HTS on reduction of ICP in patients with severe TBI or ICH. The secondary purpose is to assess safety of continuous infusion 3% HTS; identifying occurrence of hypernatremia, hyperchloremic metabolic acidosis, acute kidney injury, and in-hospital mortality.

A retrospective analysis of the electronic medical record was completed. Patients admitted to Regional Health-Rapid City Hospital (RCH) who suffered a TBI or ICH, insertion of an external ventricular drain, and received at least 24 hours of 3% HTS continuous infusion were reviewed for inclusion.

A total of 14 patients’ collective data who received continuous infusion 3% HTS and met study criteria were included. Analysis of 337 time-correlated data points shows no correlation between serum sodium and reduction of ICP. (p=0.304) This result will be used to create a hypothesis for further investigation, as well as assist in guiding care for patients at RCH. The ability to predict effects of continuous infusion HTS on ICP will contribute to improved patient care and therapy management.

Learning Objective:
Describe the correlation between serum sodium and intracranial pressure with continuous infusion 3% HTS therapy.

Incidence of Delayed Elimination and Effect of Altering Supportive Management in Patients Receiving High-Dose Methotrexate: A Retrospective Study

Kristen Peterson, Jason Barreto, Erin Barreto, Ross Dierkhising, Nelson Leung, Carrie Thompson, Mayo Clinic, 200 First Street SW, Rochester, MN 55905. Peterson.Kristen1@mayo.edu

High-dose methotrexate, defined as doses ≥ 1 gram/m2, is a cornerstone treatment for several hematologic malignancies. Delayed methotrexate elimination, defined as a serum concentration >1 µmol/L at 48 hours, contributes to both renal and non-renal toxicities. Leucovorin administration following high-dose methotrexate allows for up to 10-fold higher doses of methotrexate than otherwise tolerated and can prevent potential toxicity in the setting of renal insult or elevated methotrexate concentrations. The incidence of delayed methotrexate elimination and the potential benefits of preemptive leucovorin dose increases in patients with a history of delayed elimination are not well described.

The purpose of this study is to identify the incidence of elevated methotrexate levels at 48 hours in current clinical practice. Additionally, this study will determine the incidence of nephrotoxicity related to high-dose methotrexate. Finally, the study will assess if preemptively increased leucovorin rescue corresponds to a reduced incidence of MTX levels at 48 hours and a reduced overall hospital length of stay.

These objectives will be assessed through retrospective data collection between January 2011 and October 2017. Patient demographics and clinical characteristics will be summarized with descriptive statistics. A repeated measures Cox regression model that adjusts for multiple hospitalizations from the same patient will be used to estimate the proportion of patients with a methotrexate concentration >1 µmol/L at 48 hours and the cumulative incidence of nephrotoxicity during a hospitalization.

The results of the study will be used to implement improvements in supportive care management to benefit clinical outcomes for patients receiving high-dose methotrexate.

Learning Objective:
Describe the negative implications of improper supportive care regimens for patients receiving high-dose methotrexate.
The National Heart, Lung, and Blood Institute endorses parenteral opioids for the treatment of vasoocclusive crisis associated with severe pain. The purpose of this retrospective study is to evaluate the effect of adjuvant subdissociative-dose ketamine continuous infusion on opioid consumption and pain control among adult patients treated in the Emergency Department (ED) for acute sickle cell pain crisis.

This retrospective study has been approved by the Institutional Review Board, the treatment orderset was updated, and provider education conducted. Patients that will be included must be at least 18 years old, receive ketamine intravenous infusion at 0.5 milligram per kilogram per hour or less with a diagnosis of acute sickle cell crisis. Data points to collect include: demographics, medical history related to sickle cell disease, chief complaint, vital signs, self-reported pain intensity scores, ketamine and opioid utilization, and length of stay. The primary outcome measure is change in total daily opioid consumption in the ED. Secondary endpoints include the number of patients admitted to the hospital after receiving ketamine infusion in the ED and change in patient-reported pain intensity utilizing the numeric rating scale.

The investigators hope to learn about the effect of ketamine in a relatively unstudied unique patient population.

Learning Objective:
Outline the steps necessary to implement a practice change in prescribing habits in the Emergency Department and discuss methods to assess the impact of ketamine in treatment of acute sickle cell crisis.

The ubiquitous expression of vitamin D receptors on antigen-presenting cells has sparked investigation into its immunomodulatory effects. While previous literature has described the effect of vitamin D on graft function, the impact on immunologic outcomes has yet to be explored. The purpose of this study was to determine whether an association between vitamin D levels and immune-mediated graft function exists.

We performed a review of 240 kidney transplant recipients (KTRs); 82% were discharged on ergocalciferol 50,000 IU weekly following index hospitalization. KTRs were categorized by vitamin D levels [25(OH)D] at 1 month post-transplant as deficient (<20 ng/mL), insufficient (20-30 ng/mL), or sufficient (>30 ng/mL). Immune-mediated graft function was measured by a composite endpoint of immunologic graft loss, biopsy-proven acute rejection, and development of de novo donor specific antibodies (dnDSAs) at 12 months post-transplant.

Overall rates of rejection and development of dnDSAs were 15% and 17% respectively, with no immune-mediated graft losses. Compared to patients with sufficient 25(OH)D levels 1 month post-transplant, insufficient (OR=1.5, 95% CI 0.5 to 3.9, p=0.37) and deficient (OR=1.6, 95% CI 0.7 to 4.0, p=0.24) levels were not associated with the composite outcome at 12 months post-transplant using multiple logistic regression adjusting for age, race, gender, number of mismatches, living vs deceased donor, and panel reactive antibody (PRA) >20%. Individual immunologic outcomes did not differ significantly between groups. Our data suggests no correlation between vitamin D levels and immunologic graft outcomes, however, further studies are warranted given its well-known role in the immune system.

Learning Objective:
Describe the impact of vitamin D levels on immune-mediated graft function.
Clinical Event Impact of Augmented Versus Standard Prophylactic Enoxaparin Dosing in Hospitalized Obese Patients

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Controversy exists as to whether 40 mg once daily standard dosing of enoxaparin for prevention of VTE in hospitalized obese patients is adequate. While many studies have demonstrated the benefit of augmented twice daily dosing in regards to achieving goal anti-Xa activity, little has been published on the VTE rate with augmented dosing. In April 2016, CHI Health implemented 40 mg twice daily dosing in all patients with a BMI > 40. Prior to that, nearly all patients, regardless of BMI, received standard once daily dosing.

The purpose of the study is to assess VTE and bleeding events of 40 mg twice daily versus 40 mg once daily in hospitalized patients with BMI > 40.

The primary investigator will run an orders report in the electronic medical records system for patients who received enoxaparin 40 mg from April 1, 2014 to June 1, 2017 at CHI Health Immanuel. The primary investigator will review and collect the following baseline data: patient age, gender, surgical history within past 30 days, past history of VTE, and additional risk factors of VTE. The following data will be collected from each index encounter: level of care, enoxaparin dose, duration of therapy, length of stay, surgery during encounter (if applicable) and confirmed occurrence of VTE or major bleed within 30 days after discharge.

The results of the study will be used to assess whether utilizing 40 mg twice daily versus 40 mg once daily in hospitalized patients with BMI > 40.

Learning Objective:
Discuss the clinical impact of utilizing a dose augmented prophylactic enoxaparin dosing protocol in the hospitalized obese population as compared to standard dosing.

Implementation of an Influenza Immunization Navigator in a Stand-Alone Pediatric Hospital

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The influenza vaccine remains the best available preventive measure against influenza. Children six months and older should receive the vaccine as soon as it is available, according to the American Academy of Pediatrics (AAP) “Recommendations for Prevention and Control of Influenza in Children, 2017-2018.”

Children are at an increased risk for serious influenza-related complications, especially those younger than 5 years of age. For the past 10 years, influenza-related hospitalization rates among children younger than 5 years have always surpassed the rates for children 5 to 17 years of age. About 80% to 85% of pediatric deaths have occurred in unvaccinated children. During the 2016-2017 influenza season, 53.7% of deaths occurred in children with no high-risk medical condition. Overall, influenza vaccination rates have been suboptimal and there remains a push for quality improvement in pediatrics.

The objective of this study is to determine if an immunization navigator implemented in the electronic medical record will increase annual influenza vaccination rates among pediatric patients.

A retrospective review of patient charts from the medical/surgical units at Children’s Hospital & Medical Center in Omaha, Nebraska from the time period of November 1st to November 30th, 2016 in comparison to November 1st to November 30th, 2017 after the implementation of the influenza navigator. Results from the two seasons will be compared and analyzed using statistical methods.

The results of this study will be used for effectiveness and potential implementation of this navigator into the electronic medical record at Children’s Hospital & Medical Center.

Learning Objective:
Identify the impact of an influenza immunization navigator on pediatric vaccination rates.
A COMPARISON OF PALONOSETRON AND ONDANSETRON IN CANCER PATIENTS RECEIVING MODERATE TO HIGH EMETOGENIC CHEMOTHERAPY  Justin Presutto, Jacob Kettle, University Hospital, University of Missouri Health Care, 1 Hospital Drive, Columbia, MO 65201. presuttoj@health.missouri.edu

Chemotherapy induced nausea and vomiting (CINV) occurs in about 50 to 75 percent of all patients receiving chemotherapy. Uncontrolled nausea and vomiting can result in increased clinic and emergency room visits and hospital admissions. In addition to increased use of healthcare resources, uncontrolled nausea and vomiting increases the likelihood of the discontinuation of therapy and impedes overall quality of life. Palonosetron and ondansetron are both 5HT-3 serotonin antagonist and are both frequently utilized for the prevention of CINV.

The purpose of this study is to assess CINV-related outcomes in patients receiving moderate or high emetic risk intravenous chemotherapy receiving either palonosetron or ondansetron as prophylaxis.

These objectives will be assessed through retrospective chart review with documented episodes of nausea and vomiting, use of breakthrough antiemetics, clinic or emergency room visits, and admissions directly associated with nausea and vomiting serving as primary outcome measures.

The results of the study will be used to guide treatment and formulary decisions related to both palonosetron and ondansetron.

Learning Objective:
Identify the most efficacious and cost effective antiemetic for the prevention of CINV.

IMPLEMENTING A TAKE-HOME NALOXONE PROGRAM IN A COMMUNITY HOSPITAL SETTING  Andrea Prince, Thomas Gregory, Karrie Derenski, Chelsea Landgraf, Cox Medical Center South, 3801 South National Avenue, Springfield, MO 65807. Andrea.Prince@coxhealth.com

Opioid overdoses and opioid related deaths continue to increase throughout the United States. Opioid Overdose Education and Naloxone Distribution (OEND) have been established since the mid-1990s. Key components of OEND include prevention of overdose, recognition of overdose, reversal of overdose, and the prescribing and dispensing naloxone.

Pharmacist-driven efforts to increase naloxone provision have shown feasibility and success in various settings (i.e. Veterans Administration, emergency departments, outpatient clinics and academic health systems). Currently, there are few studies showing the feasibility of an inpatient directed take-home naloxone program in the community hospital setting. Pharmacists play a key role in implementing Opioid Stewardship by identifying high-risk patients, recommending naloxone to providers, and providing education and resources to patients, caregivers, and health care providers.

The purpose of this study is to evaluate the design and implementation of an OEND program in a community hospital setting.

Pharmacists will identify patients admitted to the family medicine inpatient service who are at risk for opioid overdose utilizing the electronic medical record. Pharmacists will then collaborate with the family medicine team to provide the patient and/or caregivers with a naloxone prescription and medication education prior to discharge. The number of patients, caregivers, and provider that accepted the provision of OEND will be evaluated. Descriptive analyses will be employed to describe processes in a reproducible manner.

The results of the study will be used implement changes within the health system to improve opioid stewardship.

Learning Objective:
To evaluate the design and implementation of a program to increase the provision of take-home naloxone in patients at risk for opioid overdose.
EVALUATION OF DEXMEDETOMIDINE FOR ALCOHOL WITHDRAWAL SYNDROME WITH CONCOMITANT BENZODIAZEPINE TREATMENT ON LENGTH OF STAY

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Benzodiazepines have existed as the pharmacologic agent of choice in patients who experience alcohol withdrawal syndrome to mitigate adverse outcomes. Unfortunately, benzodiazepines have adverse effects including respiratory depression. Dexmedetomidine is a centrally acting, relatively selective, alpha-2-adrenergic agonist. It has gained popularity as adjunctive therapy for alcohol withdrawal syndrome-associated agitation and autonomic hyperreactivity. Previous studies have identified the benzodiazepine-sparing effects of dexmedetomidine in alcohol withdrawal syndrome; however, limited evidence is available regarding overall length of stay and rates of delirium.

The primary purpose of this study is to evaluate the impact of adjunctive dexmedetomidine therapy with benzodiazepines for alcohol withdrawal syndrome on intensive care unit and total hospital length of stay. The secondary purpose of this study is to evaluate safety of adjunctive dexmedetomidine therapy for alcohol withdrawal syndrome.

The study was conducted at a 451-bed community hospital. Patients were identified through the ICD-10 codes associated with alcohol withdrawal syndrome and the objectives were assessed through chart review. SPSS® Statistical Software was utilized. Descriptive statistics were calculated, and independent t-tests and analysis of variance (ANOVA) were conducted to compare groups.

The results of the study will be used to determine the need for potential practice changes in the utilization of dexmedetomidine for alcohol withdrawal patients in the critical care units at North Kansas City Hospital.

Learning Objective
Discuss the effect of dexmedetomidine as an adjunctive therapy on length of stay in patients with alcohol withdrawal syndrome.

ORAL CHEMOTHERAPY TOXICITY MONITORING: ASSESSMENT OF ADHERENCE AT A SINGLE INSTITUTION
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Progress in the treatment of cancer has led to exponential growth in the number of patients receiving oral chemotherapy (OC). Many safeguards for intravenous chemotherapy have not been consistently adopted for OC, including toxicity monitoring. Compliance with OC monitoring at The University of Kansas Health System is unknown.

The primary objective was to evaluate overall provider compliance with baseline and ongoing toxicity monitoring for selected OC agents as specified in the package insert. A single center, retrospective chart review was conducted of patients who received at least one cycle of selected OC agents between January 1st, 2015 and July 1st, 2017. The OC agents were selected based on warnings/precautions in the package insert with specific instructions on baseline and/or ongoing toxicity monitoring. Compliance was defined as performing 100% of baseline assessment monitoring before initiation of the OC agent and/or performing 80% of ongoing toxicity monitoring within the allowable time interval for each OC agent.

Of the 153 patients included, compliance with baseline assessment monitoring was 86% and compliance with ongoing toxicity monitoring was 62%. Ongoing toxicity monitoring compliance rate before and after the implementation of clinical pharmacy services was 61% and 70% respectively. Electronic order-sets increased monitoring compliance in most OC agents, including palbociclib, the most commonly prescribed selected OC agent, where compliance increased from 55% to 80%.

Implementation of clinical pharmacy services and electronic order-sets enhanced monitoring, however, there is still opportunity for improvement in OC toxicity monitoring at our institution.

Learning Objective:
Express the importance of safeguards such as toxicity monitoring for oral chemotherapy (OC).
ANTENATAL STEROIDS IN LATE PRETERM INFANTS: A RETROSPECTIVE STUDY  Tiffany Ramos, Carla Christensen, and Kevin Fuji, 7500 Mercy Road, Omaha, NE 68124. tiffany.ramos@alegent.org

In 2016, the American College of Obstetricians and Gynecologists changed their antenatal steroid guidelines to recommend that pregnant women gestational age 34 weeks and 0 days to 36 weeks and 6 days, which is considered late preterm, receive a single course of antenatal steroids. A recent study demonstrated a significantly lower incidence of respiratory neonatal complications in late preterm infants receiving antenatal steroids.

This study aims to determine if late preterm infants receiving antenatal steroids is associated with a decrease in length of stay for neonates and respiratory treatment costs. Respiratory treatment costs will compare the cost of antenatal steroids versus the cost of treating neonatal respiratory complications, including oxygen and drug therapy, specifically antibiotics, surfactant, diuretics, and steroids. Outcomes will compare late preterm infants that received antenatal steroids to those who did not from July 1, 2014 to October 28, 2017. The primary objective will be to determine if antenatal steroids given to late preterm infants decreases the length of stay and respiratory treatment cost for neonates. Secondary objectives will determine rate of respiratory distress syndrome diagnosis, hypoglycemia events, and number of antibiotic, surfactant, diuretic, and steroid doses the neonate received.

A thorough review of the electronic health record will include singleton pregnancies at gestational age 34 weeks and 0 days to 36 weeks and 6 days. Student’s t-tests will be used for continuous variables and chi-square tests will be used for categorical variables. Study results will support antenatal steroid use in late preterm infants.

Learning Objective:
Identify pharmacoeconomic impact of antenatal steroid use in late preterm infants

ATYPICAL ANTPSYCHOTICS COMPARED TO HALOPERIDOL FOR ACUTE DELIRIUM IN HOSPITALIZED OLDER ADULTS
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Delirium is common in hospitalized older adults and can have serious consequences including increased mortality, length of stay, costs, and long-term cognitive impairment. The management of delirium is focused on addressing underlying causes and initiating supportive measures. Pharmacologic treatment may be indicated in select patients with severe agitation. Limited evidence exists on the safety and efficacy of haloperidol or atypical antipsychotics such as olanzapine, risperidone, quetiapine, and aripiprazole for the acute management of delirium in hospitalized older adults. Hence, there are no consensus guidelines on the most optimal choice for pharmacologic management when indicated. This study aims to evaluate the safety and efficacy of atypical antipsychotics versus haloperidol for the treatment of delirium in hospitalized older adults.

Data was evaluated from May 2016 to September 2017, on patients aged 70 or older admitted to an acute care or intensive care unit at Houston Methodist Hospital. Patients with delirium were identified as those with a positive delirium screen greater than 24 hours after admission using the Confusion Assessment Method for the ICU (CAM-ICU) or 4AT tool. The primary endpoint compared the proportion of patients achieving a negative delirium screen after administration of an atypical antipsychotic versus haloperidol. Secondary objectives include the incidence of QTc prolongation, serious arrhythmias, extrapyramidal symptoms, and time to negative screen for patients achieving the primary outcome. Statistical analyses will be performed using linear and logistic regression models.

Expected results include identifying the most optimal pharmacologic treatment choice for the symptomatic management of delirium in hospitalized older adults.

Learning Objective:
Identify the factors that may contribute to the development of acute delirium in hospitalized older adults.
Due to the implementation of the outcomes data initiative by the National Home Infusion Association, infusion companies initiated programs to begin data collection of the defined outcomes measures. Peer reviewed data specifically pertaining to quality improvement for patients frequenting ED’s while on service with home infusion organizations is still limited. Fairview Home Infusion continues to work to implement a new best practice model to not only improve ED utilization rates, but assist other institutions to improve patient outcomes.

A retrospective chart review was conducted through the use of an electronic medical record. Inclusion criteria included patients who were on service with Fairview Home Infusion from September 9th, 2016 to August 31st, 2017 and were seen in a Fairview ED. Patients were excluded if their ED encounter resulted in a hospitalization. Characterization was based on National Home Infusion’s “Emergency Department Use” outcomes definition.

Overall, 664 ED encounters met inclusion criteria, and to date, 286 (43%) of those encounters have been reviewed. Of those 286 encounters, 72% (206) were found to be unrelated to infusion therapy. The remaining 80 encounters (28%) were found to be related to the patient’s infusion therapy. The most common reason for ED use was Adverse Event-Access Device Related.

Based on the findings, patients on service with Fairview Home Infusion are having complications with the placement and care of their access devices. Additional teaching and new best practice models will need to help negate these complications. Further research should be done to evaluate next steps of this finding.

Learning Objective:
The purpose of this project is to characterize Emergency Department (ED) use based on the National Home Infusion Association classification and determine areas to better care for infusion patients.
Prior to leaving an inpatient stay, veterans are provided discharge counseling by inpatient clinical pharmacists who provide both an updated medication list for the veteran and document the encounter within the discharge note. These notes serve as vital hand-off tools between inpatient and outpatient pharmacists, specifically for those pharmacists who are leading outpatient clinics involved with anticoagulation, home IV therapy, and heart failure. Currently, there is very little documentation and information contained within the discharge note to serve as the primary means of communication between pharmacy provider’s, however, they are often the primary method utilized to communicate a plan of care.

The purpose of this project is to standardize the pharmacy discharge summary, and include key details regarding home IV therapy, anticoagulation, and heart failure within the discharge note to increase both continuity of care for veterans and hospital performance measures for reduced readmission rates. The primary objective is to assess outpatient pharmacists satisfaction regarding the discharge note and the transitions they provide through a pre and post survey. An additional objective is to evaluate the time from discharge to follow-up with an outpatient pharmacist through a pre and post analysis.

The results of this project will be used to guide and strengthen transitions of care for veterans at the Kansas City Veterans Affairs Medical Center, specifically in the pharmacist-led clinics, and provide additional evidence to support the need of additional input in discharge notes for appropriate continuity of care to manage veterans’ acute and chronic disease states.

Learning Objective:
Discuss the impact of discharge summaries in developing appropriate continuity of care to outpatient pharmacy-led clinics for the Veteran population.

Pharmacists integrated into the multidisciplinary intensive care unit (ICU) team improve clinical outcomes and increase patient safety. Minimal data exist to optimize critical care pharmacists care of critically ill patients leading to widespread practice variation in pharmacist staffing ratios and how patients are cared for. The Medication Regimen Complexity Index (MRCI) was developed in 2004 as a tool to help quantify drug regimen complexity. Augusta University Medical Center recently developed and validated the MRC-ICU scoring tool in medical intensive care (MICU) patients. A retrospective analysis utilizing the MRC-ICU scoring tool was completed on 75 patients at CoxHealth to create a scoring algorithm encompassing three severity groups based on patient score.

The purpose of this study is to evaluate the implementation of a prospective scoring algorithm utilizing the MRC-ICU score to assist in appropriate triage that allows for more targeted pharmacist interventions. The primary objective of this study is to validate the MRC-ICU scoring tool on pharmacist MTM interventions by evaluating if the MRC-ICU score algorithm predicts number of pharmacist interventions. Secondary objectives include a descriptive analysis of interventions identified from each MTM consult, revenue generated from each MTM consult, and the average amount of time spent completing each MTM consult.

This single center, prospective study, approved by the Institutional Review Board at CoxHealth included patients admitted to the MICU with MTM services provided between 2/29/2018 to 3/25/2018. Patient identification and data was obtained via manual chart review of electronic health record and electronic databases. Data analysis is underway.

Learning Objective:
Calculate the MRC-ICU score
AN OUTCOMES ASSESSMENT OF A CLOSTRIDIUM DIFFICILE INFECTION TREATMENT ORDER SET AND CONCORDANCE WITH TREATMENT GUIDELINES FOR SEVERITY OF ILLNESS
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Clostridium difficile infection (CDI) is associated with significant morbidity and mortality, as well as high healthcare costs. Practice guidelines have provided treatment recommendations based on severity of illness. Previous studies have demonstrated poor provider adherence to algorithm-based treatment recommendations in CDI. A proposed reason for non-adherence is the inconvenience of navigating multiple guidelines and algorithms in order to determine appropriate first-line CDI treatment. To alleviate these issues, The Nebraska Medicine Antimicrobial Stewardship Program implemented a best practice alert (BPA) and CDI order set in March 2014 to streamline prescribing.

This is a quasi-experimental study designed to compare provider adherence to practice guidelines before and after implementation of a BPA and order set for CDI. Additional endpoints are resolution of diarrhea, length-of-stay, in-hospital mortality, 30-day recurrence rate and 30-day readmission rate.

The study objectives will be assessed through retrospective patient chart review. Approximately 200 inpatients diagnosed with CDI between January 1, 2013-December 31, 2016 will be collected based on a calculated 80% power to detect a 30% increase in guideline adherence. Descriptive statistics will be reported and SPSS® analysis will be conducted to evaluate outcomes.

By demonstrating the value of a CDI BPA and treatment order set in improving provider adherence to guideline recommendations, CDI treatment can be optimized to minimize complications and costs. Additionally, results from this study will aid the Antimicrobial Stewardship Team in determining future steps to improve the use of guideline-based therapy at Nebraska Medicine.

Learning Objective:
Describe the change in prescribing patterns for CDI after incorporating a best practice alert (BPA) and order set at Nebraska Medicine

WEIGHT BASED VS NON-WEIGHT BASED NOREPINEPHRINE IN SEPTIC SHOCK AND ADDITIONAL VASOPRESSOR REQUIREMENTS
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Current guidelines for the management of septic shock recommend norepinephrine as first line to maintain adequate blood pressures; however, the guidelines do not provide recommendation on dosing strategies. There are currently limited studies published comparing weight based norepinephrine versus non-weight based. Norepinephrine is dosed and titrated differently between two large hospitals in Wichita, KS. The purpose of this study is to assess if there is a difference in additional vasopressor administration between weight based and non-weight based dosing of norepinephrine in septic shock. The secondary purposes of this study are to assess if there is a difference in ICU length of stay (LOS), hospital LOS, duration of mechanical ventilation and mortality between the two groups.

Patients who were greater than 18 years of age, diagnosed with severe sepsis with septic shock, had a serum lactate > 2 mmol/L and received norepinephrine as the first vasopressor were included. Patients were excluded if admitted to the trauma department, underwent cardiothoracic surgery, sustained thermal injury or were transferred from an outside facility on vasopressors. Data collection included demographic data, source of infection, serum lactate, APACHE II score, additional vasopressor requirements, type of vasopressor added, initial norepinephrine rate, max norepinephrine rate, norepinephrine rate if/when vasopressin was added, hospital LOS, ICU LOS, ventilator days and mortality. Data collection is currently ongoing. Results of this study may help in determining which dosing strategy may be vasopressin sparing.

Learning Objective:
Review vasopressor recommendations in the Surviving Sepsis guidelines
The National Asthma Education and Prevention Program (NAEPP) recommends continuous albuterol 0.5 mg/kg/hr, up to maximum doses of 15-30 mg/hr for patients experiencing a severe asthma exacerbation. In effort to avoid intubation and decrease PICU length of stay, higher doses of 75 mg/hr and 150 mg/hr continuous albuterol have been recently studied. Previously a dose of 15-20 mg/hr continuous albuterol was used at Wesley Children’s Hospital and a dose of 50 mg/hr or greater is now current practice. The purpose of this study is to determine if there is a difference in the PICU length of stay by administering continuous albuterol 50 mg/hr or greater compared to less than 50 mg/hr. Secondary outcomes include, use of respiratory support (BiPAP or mechanical ventilation), use of additional intravenous beta agonist (terbutaline), maximum heart rate, rates of hypokalemia (potassium level < 3.0 mmol/L) and need for potassium replacement while receiving continuous albuterol.

All patients with an admitting diagnosis of status asthmaticus or asthma who receive continuous albuterol 50 mg/hr or greater within one hour of initial dose in the PICU will be included. Using historical data, the same number of patients who received a dose less than 50 mg/hr will be included. Descriptive data will be expressed by using frequencies (%) and mean +/- SD. Chi-square and student’s t-test will be utilized for nominal and continuous data, respectively. A sample size of 45 patients for each group was calculated based on 80% power and alpha of 0.05.

Learning Objective:
Review the safety and efficacy of higher dose continuous albuterol in pediatric patients with status asthmaticus.
Invasive fungal infections in allogenic bone-marrow transplant patients are a major source of morbidity and mortality. Early detection of fungal infections is crucial for effective treatment, but diagnosing is often challenging. Fungitell assay, which detects the fungal cell-wall component (1 → 3)-β-D-glucan, may assist with early diagnosis, but false positive results due to interacting substances may occur. Suspected falsely elevated (1 → 3)-β-D-glucan values have been reported in bone marrow transplant patients receiving immunoglobulin products (3,5). This study intended to characterize the magnitude of immunoglobulin exposure impact on Fungitell assay values in allogenic bone-marrow transplant patients compared to that of a control group. Secondary objectives included quantifying the elevation in Fungitell level in relation to the dose received and timing of immunoglobulin administration.

A single-center, retrospective chart review of adult allogenic bone-marrow transplant patients with a Fungitell level drawn between June 1, 2014 to October 1, 2017 was conducted. Patients that received immunoglobulin therapy within three months prior to the recorded Fungitell level were compared to a control group that did not receive immunoglobulin. Patients were excluded if they had received albumin products within three months prior to Fungitell results.

This study aims to determine if there is a correlation between elevated Fungitell assays and administration of immunoglobulin in an effort to optimize antifungal treatment in allogenic bone-marrow transplant patients.

Learning Objective:
Understand immunoglobulin administration effects on Fungitell assay results
According to the Centers for Disease Control and Prevention, approximately 10% of patients report an allergy to penicillin, however less than 1% of the population is truly allergic. In addition, the estimated cross-reactivity between penicillins and cephalosporins or carbapenems is less than 1%, so in many patients with a reported penicillin allergy, cephalosporins and carbapenems can be safely used. These reported penicillin allergies lead to the unnecessary use of alternative therapies, which may be inappropriate first line options. These therapies may also be more expensive, lead to increased resistance, and cause more adverse effects, such as *Clostridium difficile*.

The objective of this study is to develop and evaluate a guideline for use by inpatient providers, pharmacists, nurses, and medication historians that provides guidance on accurately assessing a reported beta-lactam allergy and safely using beta-lactam antibiotics in these patients.

The guideline will include an algorithm based on the patient-reported reaction to a beta-lactam. To determine the patient's reaction, medication historians and pharmacists will be using a questionnaire to gather more information on the patient's reported penicillin allergy upon admission to the hospital. The algorithm will direct providers to when a beta-lactam antibiotic may be prescribed and if a test dose should be ordered prior to prescribing the full dose of a beta-lactam antibiotic.

The results of this study will aim to show the benefit of a beta-lactam allergy guideline through an increase in the frequency of beta-lactam antibiotics being prescribed over alternative antibiotics and more thorough documentation of penicillin allergies.

**Learning objective:**
Identify when a beta-lactam test dose may be given to patients with a reported penicillin or cephalosporin allergy
IMPACT OF DISCHARGE PHARMACY TRIFECTA OPTIMIZATION AT A HEALTH-SYSTEM COMMUNITY HOSPITAL ON IMPROVING PATIENT CARE TRANSITIONS

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Medication errors are common at hospital discharge and studies have shown pharmacist interventions during care transitions improve the quality of the discharge process as well as reduce preventable readmissions and adverse drug events.

Our 184-bed community hospital has standard processes to provide pharmacist discharge medication reconciliation review (DMRR) and delivery of discharge medications to the bedside (meds-to-bed), yet only 50% and 20% of patients discharging receive these services, respectively. Additionally, HealthEast offers Medication Therapy Management (MTM) services; however, there are no standard processes for identification of patients and scheduling of post-discharge MTM visits. Based on previous studies, providing patients with the discharge pharmacy trifecta (DMRR, meds-to-bed, and MTM referral upon discharge) would improve their transitions of care.

The process improvement objective of this study is to improve the discharge medication reconciliation review and MTM referral processes to increase the amount of patients who receive the discharge pharmacy trifecta. The patient outcomes objective of this study will evaluate if increasing the amount of patients who receive the discharge pharmacy trifecta subsequently results in reduced 30-day hospital readmission and emergency department utilization post-discharge rates.

This project has three phases: (1) implementation of the pharmacist driven MTM referral process, (2) optimization of pharmacist DMRR, (3) evaluation of outcomes. Analysis of the aforementioned objectives will be conducted comparing pre- and post-intervention groups.

The results of this study may offer a sustainable health-system pharmacy practice model, incorporating hospital, community, and ambulatory care pharmacists, to improve the quality of care patients receive upon hospital discharge.

Learning Objective:
Describe the components of the discharge pharmacy trifecta and the value this provides to a patient discharging from the hospital.

DEVELOPMENT OF A RISK ASSESSMENT TOOL FOR TARGETED INPATIENT MEDICATION HISTORY


Inaccurate medication histories taken at admission have been associated with over one-quarter of hospital prescribing errors, the majority of which are only discovered through patient interview. The single biggest predictor of discrepancies in medication history is the number of medications upon admission. It is unknown if specific medications are associated with higher rates of discrepancies. It has been found that pharmacists identify significantly more discrepancies on the initial medication history than other healthcare providers; however, pharmacists at Wesley Healthcare are not able to complete every medication history and must prioritize based solely on clinical judgment.

The purpose of this quality improvement project is to identify patient home medications on the initial medication history that are most likely to be associated with a discrepancy upon hospital admission with the intent to create a tool alerting pharmacists to the presence of these medication(s). The data collection process began in August 2017 and will be continually evaluated as part of the plan-do-study-act (PDSA) process to identify medications associated with higher rates of discrepancies. Medications found to be associated with significantly higher incidences of discrepancies will be incorporated into a tool to alert clinical pharmacy staff. This alerting tool will be implemented to aid the clinical judgement of pharmacists in identifying patients most likely to have inaccurate initial medication histories. Descriptive statistics will be used to present PDSA results.

Learning Objective:
Identify medications associated with higher rates of discrepancies on initial medication history.
INFLUENCE OF GENES IMPORTANT IN RENAL SODIUM HANDLING AND THE BLOOD PRESSURE RESPONSE TO A DIURETIC IN HYPERTENSION

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Successful reductions in blood pressure (BP) with antihypertensive therapy reduce cardiovascular (CV) events, such as myocardial infarction, heart failure, and stroke. Antihypertensive therapy algorithms reflect BP response differences in age and race, but inter-individual variation is evident. The distribution of responses to hydrochlorothiazide, a thiazide diuretic, resembles a Bell-shaped curve.

Several genes affect renal electrolyte homeostasis. The WNK1 gene, which codes for a WNK (“with no lysine” [K]) protein, has an integral role in pathways regulating renal tubular sodium transport. Adducin is a cytoskeletal protein involved in signal transduction and has a genetic polymorphism associated with increased proximal tubular reabsorption of sodium. Genetic mutations can affect gene functionality, which may better predict response to diuretics. The purpose of this study is to evaluate the impact of a genetic panel on BP prediction success in response to diuretic therapy.

Patients who return a buccal swab after meeting inclusion and exclusion criteria and consenting to enrollment will be included in chart review. Patients on thiazide therapy will be divided into two groups: those mathematically predicted to respond to diuretic therapy and those who are not. The primary outcome is to assess BP changes in response to diuretic therapy based on multiple genes impacting renal sodium handling using mathematical prediction. Genes in the analysis include WNK1 (rs1801253, rs1159744, rs2107614), SLC12A3, SCNN1A, and alpha-adducin.

Results obtained through this study will attempt to validate the use of a multi-gene panel targeting renal sodium handling to predict response to thiazide diuretic therapy.

Learning Objective:
Describe the impact of blood pressure changes in patients who were predicted to respond or not respond to diuretic therapy based on multiple genes influencing renal sodium handling.

EVALUATION OF TRANSITIONAL CARE MANAGEMENT SERVICE OPPORTUNITIES BY CLINICAL PHARMACISTS IN A COMMUNITY HEALTH SYSTEM

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Transitions within the health system are often not ideally managed, leading to increased readmissions, greater overall cost, and declines in patient outcomes. The intent of Transitional Care Management (TCM) services through Centers for Medicare and Medicaid Services (CMS) is to address these issues, incentivizing better transitional care. Utilization of TCM services is complex and often forgone in favor of simpler billing processes. Evidence shows the beneficial role pharmacists play in successful patient transitions.

This study’s purpose is to identify current workflow gaps and barriers to implementation of TCM services as well as describe the potential impact of pharmacist-driven TCM services. Secondary purposes include identifying current completion rates of each of the 3 qualifying steps of TCM billing, describing the potential impact of implementing pharmacist-driven TCM services for patients discharged from CoxHealth South from qualifying primary care providers, and estimating the financial impact of TCM services by identifying missed potential revenue among qualifying patients.

These objectives will be assessed through retrospective review of the electronic medical record. Quantitative data will be analyzed using descriptive statistics, and themes for addressing the primary outcome will be assessed qualitatively.

The results will then be used to synthesize an assessment of current workflow gaps, potential areas for workflow change, and the potential impact of increased pharmacist involvement in TCM services.

Learning Objective:
Describe the potential impact of pharmacist-led transitional care management opportunities in a community health system.
Adverse drug events are a common issue for patients following hospital discharge. Many patients will have medication changes during an inpatient stay and discharge medication orders can be accompanied by confusion. Inpatient pharmacists’ clinical experience can be helpful in evaluating discharge medication orders. The purpose of this project is to assess the value and feasibility of adding pharmacist participation in discharge medication reconciliation.

This is a single center, prospective quality improvement study. Collaborating physicians will inform the pharmacist about patients they plan to discharge and for whom discharge medication orders have been written. The pharmacist will evaluate each patient’s prior to admission medications, hospital course, and discharge medication orders. Recommendations will be made to the physician regarding any changes/interventions (may include missing medications, duplicate medication orders, inappropriate dosing/duration, etc.). The physician will determine if these recommendations are appropriate for his/her patient. The primary outcome assessed will be change in physician-specific potentially preventable readmission rates within 30 days of discharge. A secondary outcome measure will be results of a survey given to participating physicians to assess if they felt the project contributed towards improved patient care.

Pharmacists are currently not involved with discharge medication reconciliation at United Hospital. The results of the study will be assessed for opportunities to improve current practice during transitions of care and to assess feasibility of this collaboration in the future. This will help guide further pharmacist involvement in discharge medication reconciliation, could provide for improved patient care, and increase pharmacists’ role within the hospital.

Learning Objective:
Assess the value and feasibility of adding pharmacist participation in discharge medication reconciliation.

Given the bleeding risk with the initiation of pharmacological venous thromboembolism (VTE) prophylaxis in patients with traumatic brain injury (TBI), there was inconsistencies in the timing of initiation of prophylaxis in patients with TBI. Because of this, the trauma department adapted a TBI VTE prophylaxis algorithm from the Parkland Protocols Modified Berne-Norwood Criteria.

The purpose of this study is to assess utilization of the Trauma TBI VTE Prophylaxis Protocol implemented on March 1, 2016 as it pertains to the timing of initiation of pharmacological VTE prophylaxis. All data will be collected via the trauma registrar and retrospective patient chart review via the electronic medical record. The following data will be collected: age, gender, mechanism of injury (blunt vs penetrating trauma), anticoagulant/antiplatelet usage, and initial Glasgow Coma Scale (GCS). Other data to be collected will include: time to pharmacological VTE prophylaxis (low-risk TBI by midnight of hospital day 2 and high-risk by midnight of hospital day 4), bleeding event defined as progression of ICH confirmed by CT head scan, need for blood transfusion, and occurrence of VTE as confirmed by doppler/computed tomography (CT).

The results of this study will be used to assess the uniformity of time to pharmacological VTE prophylaxis in this patient population based on use of the Wesley Medical Center trauma department TBI VTE Prophylaxis Protocol and the need to implement changes going forward to improve patient safety.

Learning Objective:
Review data in regards to time to initiation of pharmacological venous thromboembolism (VTE) prophylaxis in traumatic brain injury (TBI) patients based off utilization of the Wesley Medical Center trauma department TBI VTE prophylaxis algorithm adapted from the Parkland Protocols Modified Berne-Norwood Criteria.
Direct oral anticoagulants (DOACs) offer fixed-dose regimens for their indications. Unlike other anticoagulants, DOACs do not require therapeutic drug monitoring or dose adjustment according to the weight of the patient. Despite these benefits, there is very little information published on the safety and efficacy of fixed-dose DOAC regimens in under and over-weight patients. Consequently, none of the available DOACs have any suggested dose adjustments for weight extremes. The main concern with DOAC fixed dosing is the potential for increased exposure in underweight patients, which may lead to an increased risk of bleeding. Conversely, there is the potential for under-anticoagulation of overweight patients leading to an increase in clotting.

The purpose of our study is to retrospectively assess both the efficacy and safety of direct oral anticoagulants (apixaban, rivaroxaban, edoxaban and dabigatran) in patients with BMI of > 40 kg m², and underweight individuals with BMI < 18.5 m². A data report will be retrieved on patients admitted to a Fairview institution from 2011 until 2015. Only patients that were on a direct oral anticoagulant who are under or overweight will be included. We will assess clotting and major bleeding events that occurred during their hospitalization. This data will be used to look at these events and assess if a correlation exists with weight. Patients who have undergone bariatric surgery will be excluded. Confounding variables that may contribute to bleeding/clotting will also be collected, including the administration of -anti-platelets, other anticoagulants, reversal agents, and diagnosis codes associated with these events.

**Learning Objective:**
Assess both the efficacy and safety of direct oral anticoagulants (apixaban, rivaroxaban, edoxaban and dabigatran) in under and overweight patients.

According to the Centers for Medicare and Medicaid Services (CMS), twenty percent of patients discharged from an acute care setting return to the hospital within 30 days of admission due to adverse drug events (ADEs), hospital-acquired infections, and procedural complications. Foster et al. (2003) discovered nineteen percent of patients experienced an ADE within 5 weeks of discharge from the hospital and one third of ADEs were preventable. Moreover, less than sixty percent of patients understood the indication for the new medications prescribed at discharge. Recent studies have demonstrated pharmacist involvement in discharge education and facilitating the post-discharge transition of care results in decreased patient re-admissions and improved patient outcomes. At Lawrence Memorial Hospital (LMH), pharmacists provide discharge medication education to patients enrolled in a bedside medication delivery service; however, patients not enrolled in this service receive a different level of care. The purpose of this project is to establish a standard of care for all discharged patients to improve the transition of care experience.

The objective of this study is to identify the pharmacists’ perceived barriers to the current discharge process, standardize the pharmacist role in transitions of care, and create a method to track metrics for quality assurance. Pharmacist interventions will be measured over a 30-day pilot of all inpatients units, excluding the maternal-child unit. The result of this pilot will determine future directions for this service.

**Learning objective:**
Identify pharmacist interventions during transitions of care.
THE EFFECT OF TOPICAL LIDOCAINE ON SAFETY NET ANTIBIOTIC PRESCRIPTION FILL RATES IN CHILDREN WITH NON-SEVERE ACUTE OTITIS MEDIA

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Despite guidelines recommendations to implement watchful waiting in children with acute otitis media (AOM), ear pain continues to prompt early, unnecessary use of antibiotics in cases that are likely to resolve without treatment. The use of topical analgesics has been suggested in this patient population, but optimal use has yet to be established in the United States due to limited product availability.

This single-center, randomized, double-blind, placebo-controlled trial will assess the efficacy of a compounded topical lidocaine ear drop formulation compared to placebo in reducing the use of antibiotics in children with AOM. Patients aged 6 months to 10 years presenting to the emergency department (ED) with AOM will be randomized 1:1 to receive topical lidocaine or placebo in addition to standard care including a safety net antibiotic prescription (SNAP). Parents will be instructed to fill the SNAP after 48 hours only if their child’s symptoms have worsened or not improved. The primary outcome will be the difference in parent-reported antibiotic use between study groups based on follow-up telephone survey after 48 hours. Secondary outcomes will include pain score reduction in the ED following first dose, parent-reported satisfaction, and adverse effects.

We hypothesize that children who receive topical lidocaine will have a reduced rate of antibiotic use during the study period.

Learning Objective:
State the impact of optimizing pain control on antibiotic stewardship for children with acute otitis media.

EVALUATION OF COMMUNITY PHARMACISTS’ IMPACT ON PATIENT OUTCOMES IN HEPATITIS C INFECTED INDIVIDUALS

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Hepatitis C Virus (HCV) is the most common chronic bloodborne infection in the United States. Chronic Hepatitis C can cause serious health problems including cirrhosis, cancer, and liver transplant. The management, care and treat of HCV have come a long way since the CDC first identified HCV in 1989. With new direct acting antivirals on the market, community pharmacists can recommend appropriate therapy, identify drug interactions, and improve patients’ compliance. The purpose of this study is to evaluate community pharmacists’ impact on improving patient outcomes in Hepatitis C infected individuals.

The primary objective is to describe medication-related problems (MRPs) identified by community pharmacists in patients taking hepatitis c viral (HCV) medications. The secondary objective is to identify if pharmacist interventions lead to decreased detectable SVR rates.

Pharmacists will counsel patients upon treatment initiation and assess ongoing treatment success and toxicity through patient appointments, telephone calls, adherence to therapy, and the ordering of pertinent laboratory data. Data will be assessed before and after the implementation of pharmacist interventions.

Data will be conducted in a retrospective and prospective manner using patient charts whose therapy was initiated and completed between March 1, 2017 to June 31, 2017 and from September 1, 2017 to December 31, 2017. Only data for patients whose planned HCV therapy is of 12 weeks duration or less will be included. Data collection points will include the number of pharmacist interventions for drug interactions and side effects, patients’ adherence to scheduled lab appointments and refills, and SVR result 3 months after completion of therapy. The results of the study will be used to improve patient care and patient satisfaction in the clinic.

Learning Objective:
With new direct acting antivirals on the market, community pharmacists can recommend appropriate therapy, identify drug interactions, and improve patients' compliance.
Naloxone is a life-saving medication for patients at risk of opioid overdose. Candidates likely to benefit from naloxone include those with an opioid use disorder diagnosis, a prescription for long-acting opioids, using opioids plus a benzodiazepine and/or alcohol, or opioids plus chronic hepatitis, cirrhosis, alcohol use disorder, or COPD. The Veterans Affairs (VA) Opioid Safety Initiative (OSI) was launched in light of evidence showing a 124% increase in unintentional opioid overdose deaths in the US between 1999 and 2007. The VA Overdose Education and Naloxone Distribution (OEND) program is a component of the OSI that aims to reduce harm and risk of life-threatening opioid-related overdose and deaths among veterans. Key components include education and training regarding opioid overdose prevention, recognition of opioid overdose, opioid overdose rescue response, and issuing naloxone kits.

The objective of this retrospective review is to evaluate the VA OEND program within the Nebraska-Western Iowa Healthcare System (NWIHCS) and increase dispensing of naloxone kits to veterans who are at risk for opioid-related overdose.

A NWIHCS database search generated a list of veterans who had received a naloxone prescription from 10/1/13 to 9/1/17. Chart reviews were conducted to gather additional data to determine the impact of the initiation of a medication therapy management consult (3/17/17) and formal pharmacy education (5/3/17) on naloxone prescribing.

The results of the study indicate that the use of the consult and formal pharmacy education has increased dispensing of naloxone prescriptions in the short amount of time since the implementation.

Learning Objective:
Identify patients at increased risk for opioid-related overdose
Improving Inpatient Glycemic Control in General Medicine Patients at an Academic Medical Center

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Approximately 35% of hospitalized patients in the United States have diabetes mellitus or experience hyperglycemia during their hospitalization. Studies in current literature have well documented adverse outcomes associated with poorly controlled blood glucose levels, both hypoglycemia and hyperglycemia, in hospitalized patients. Increased hospital length of stay, infection risk, poor wound healing, and death are a few. Despite the known detrimental effects, the challenges associated with inpatient glycemic management often prevent attainment and maintenance of optimal blood glucose levels.

The purpose of implementing a glycemic control protocol is to develop a standardized process for treating patients who require hyperglycemic control on the internal medicine unit. Multidisciplinary efforts have been implemented to decrease the persistence of blood glucose readings greater than or equal to 200 mg/dL measured within a 24-hour period.

The pharmacist’s role is to prospectively identify all patients with a diagnosis of type II diabetes admitted to the pilot internal medicine floor and optimize blood sugar control. Primary recommendations include restarting home oral antihyperglycemics when appropriate, tightening sliding scale insulin based on patients insulin sensitivity factor, and adjustments in basal and nutritional insulins.

Data prior to the process implementation has been collected. Three to five month post-implementation data will be collected for comparison analysis and reviewed for success, defined as a decrease in consecutive blood glucose readings greater than 200 mg/dL within a 24-hour period.

Learning Objective:
Review current recommendations and best practices for inpatient glycemic control in non-critically ill patients.

Impacting Transitions of Care: The Role of Pharmacist Medication Reviews in the Skilled Nursing Population

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Patients are vulnerable during transitions of care periods. They are put at risk for medication errors that may lead to poor health outcomes and increased healthcare costs. Despite this, there is a lack of consistent pharmacist involvement during this period. Patients who are admitted and discharged from SNFs are at increased risk due to multiple transitions, polypharmacy, and complex acute and chronic conditions. This study will evaluate the need for pharmacist completed comprehensive medication reviews for SNF patients during transition of care periods.

The primary purpose of this study is to determine identified drug therapy problems in skilled nursing facility (SNF) patients throughout transitions of care. Secondary outcomes will evaluate provider satisfaction.

The objectives will be assessed by tracking the number and type of pharmacist interventions. Identified drug therapy problems will be categorized as follows: duplicate therapy, omission in therapy, need for additional therapy, wrong dosage, drug-drug interaction(s), need for further education, and adverse drug reactions. The total number of drug therapy problems identified per category will be statistically analyzed to determine the impact pharmacist interventions have on health outcomes for this specific patient population. Provider satisfaction will be evaluated through emailed surveys.

The results of this study will help determine the permanent and consistent need for comprehensive medication reviews provided by clinical pharmacists upon transitions of care. Furthermore, the results can be used to aid other institutions in deciding the benefits of involving a pharmacist when patients are transitioned between levels of healthcare.

Learning Objective:
Identify the need for pharmacist medication reviews during transitions of health care for skilled nursing facility patients.
INCIDENCE OF ACUTE KIDNEY INJURY AMONG CRITICALLY ILL PATIENTS WITH BRIEF CONCOMITANT EXPOSURE TO AN ANTI-PSEUDOMONAL BETA-LACTAM AND VANCOMYCIN

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Acute kidney injury (AKI) affects 20% to 50% of critically ill patients and confers considerable morbidity and mortality. Sustained exposure to concomitant piperacillin/tazobactam (PTZ)/vancomycin (VAN) administration has been associated with an increased risk of AKI, but what remains unknown is whether, in an era of antimicrobial stewardship and rapid de-escalation, brief exposure to PTZ/VAN carries the same risk.

This was a single center retrospective cohort study of 3,299 adult ICU patients that received 24-72 hours of concomitant therapy with vancomycin and an antipseudomonal beta-lactam [PTZ/VAN, cefepime/vancomycin (CEF/VAN) or meropenem/vancomycin (MER/VAN)] from 2006-2016. Risk for AKI, adjusted for baseline demographics, severity of illness, and AKI risk factors were evaluated between treatment groups with multivariable logistic regression.

The primary endpoint of moderate to severe AKI (stage II or III) was not different between groups in univariate analyses (OR for PTZ/VAN 1.02; 95% CI 0.85-1.21, p = 0.86) and after adjustment for baseline AKI risk (OR for PTZ/VAN 1.05; 95% CI 0.88-1.25, p = 0.60). PTZ/VAN was significantly predictive of any AKI, driven primarily by stage I episodes (adjusted p = 0.002 after adjustment for confounders). No difference was observed in persistent doubling of serum creatinine out to 3 months from the exposure (p = 0.081).

The results of this study suggest that brief exposure to broad-spectrum antibiotic courses which include PTZ/VAN do not heighten the risk for moderate to severe AKI or sustained renal dysfunction in critically ill patients compared to other anti-pseudomonal beta-lactam/vancomycin combinations.

Learning Objective:
Explain the risk of moderate to severe acute kidney injury associated with 24-72 hours of concomitant anti-pseudomonal β-lactam and vancomycin administration.

IMPROVING DELIRIUM ASSESSMENTS USING THE CONFUSION ASSESSMENT METHOD FOR THE INTENSIVE CARE UNIT (CAM-ICU): A QUALITY IMPROVEMENT PROJECT

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The CAM-ICU is a validated tool used to screen for delirium in the intensive care unit (ICU). Several inappropriate unable-to-assess (UTA) ratings and inaccuracies with the overall assessment of the CAM-ICU tool have anecdotally been noted in a mixed ICU. These inappropriate UTA ratings and inaccuracies may indicate an educational gap regarding delirium and/or how to properly use the CAM-ICU tool.

The objective of this before/after quality improvement project is to evaluate the frequency of inappropriate CAM-ICU ratings prior to and following an educational program, with the primary endpoint being the frequency of inappropriate CAM-ICU ratings.

Patients admitted to the ICU from June 1st, 2017 through August 31st, 2017 will be retrospectively reviewed to serve as the baseline control group. An educational program will be developed consisting of, but not limited to, nursing education, presentation of unit-wide compliance and accuracy data, and incorporation of patient delirium assessments into daily multidisciplinary rounds. The educational program will be implemented in December 2017. Patients admitted to the ICU in the first two months following completion of the educational program will comprise the post-education group.

The results from this study will be used to assess improvement in the identification of delirium in ICU patients and to eventually develop a delirium prevention and treatment protocol for the ICU.

Learning Objective:
Explain the importance of identifying and treating delirium in ICU patients.
**EVALUATION OF VIRAL ENTERITIS IN INTESTINAL TRANSPLANT RECIPIENTS** Abigail Schweitzer, Diana Florescu, Mary Vacha, Megan Keck, Nebraska Medicine, 988147 Nebraska Medical Center, Omaha, NE 68198-8147.

Infections are a major cause of morbidity and mortality in intestinal transplant recipients. These patients are at high risk for infectious enteritis due to the immunosuppression required to prevent acute and chronic rejection and improve survival. The objective of this study is to provide a more thorough understanding of the incidence, risk factors, clinical course, and treatment of viral enteritis post-intestinal transplant. Our study could guide practitioners on how to better monitor and manage these patients, which may improve outcomes.

This retrospective chart review includes all intestinal transplant recipients transplanted from January 1, 2008 to December 31, 2016 at our academic medical center. The primary outcome is the incidence of viral enteritis post-transplantation. Secondary objectives include identification of risk factors for viral enteritis, assessment of time-to-symptom resolution, hospital length of stay, treatment strategies, and evaluation of the incidence of rejection, graft loss, and death after viral enteritis. Descriptive statistics will be calculated.

The results of this study will be used to add to the limited information available regarding infectious complications post-intestinal transplant and provide direction on how to reduce the incidence and/or manage these infections in the future.

**Learning Objective:**
Describe the incidence, risk factors, timeline, and treatment for viral enteritis post-intestinal transplant and explain the impact it has on transplant outcomes.

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**IMPACT OF PHARMACIST INTERVENTIONS ON COPD-RELATED QUALITY OF LIFE** Michael Serlin, Lauren Odum, Christopher Carter, SSM Health St. Clare Hospital, 1015 Bowles Avenue, Fenton, MO 63026

COPD has an increasingly negative impact on quality of life, both worldwide and in the United States. Utilizing Disability-Adjusted Life Years (DALYs) as a measure of years lost due to mortality and severity of disability, COPD has not only risen from the eighth leading cause of reduced DALYs to the fifth leading cause worldwide, but COPD has also been the second leading cause of reduced DALYs in the United States. Few studies have examined the impact pharmacists can have on COPD-related quality of life when working in a multidisciplinary model. Additionally, the conclusions from these studies remain unclear due to mixed results from these studies.

The objective of this study is to determine whether adding pharmacists to usual care results in improved COPD-related quality of life. Secondary objectives of this study are to examine whether pharmacists can improve lifestyle factors in COPD patients, including increasing vaccination rates and increasing smoking cessation interest.

These objectives are being assessed through a randomized trial in which half of the patients meet with a pharmacist and their provider, while the other half only meets with their provider. The primary endpoint of change in COPD Assessment Test scores between groups will be analyzed via t-test. Other secondary endpoints will be analyzed via chi-square or Fisher exact test for nominal data, Mann-Whitney U for ordinal data, and t-test for continuous data.

The pending results of this study will potentially be used to implement multidisciplinary COPD services in a family medicine clinic at our community hospital.

**Learning Objective:**
Recall ways in which pharmacists can supplement and add benefits to current COPD care.
Rural healthcare systems crucially rely on the availability of life-saving medications, such as factor products or biologics. Establishing balance between high cost, emergent needs, stocking costs, sporadic use, and inventory management to prevent loss are challenging barriers. Specialty distributors can contract with hospitals to provide high cost medications through consignment service to mitigate need and availability while minimizing inventory expenditures.

The purpose of this study was to conduct utilization and cost projection analyses within a healthcare system to determine potential benefits of consignment service compared to prior traditional inventory management. A secondary purpose was to assess frequency of prothrombin complex concentrate use to identify capable sites in need of the factor product to reduce time to emergent treatment.

Electronic inventory for a one-year period (7/1/2016 – 6/30/2017) was used to compare the cost of stocked inventory with actual product use and outdated product loss. Cost savings per medication were determined as difference between inventory acquisition cost and cost of consignment pricing. Analysis of prothrombin complex concentrate use included assessment of geographic trends, patient volumes, and administration capability for high volume sites. A needs analysis with projected stocking cost of this product will be performed for potential sites with greater needs.

The results of this study will be used by organization administrators for determining pharmacy, formulary, and expenditure initiatives. Results in the second objective will be used for decisions regarding possible increased distribution of the factor product.

**Learning Objective:**
Identify cost savings benefit of consignment services and explain impact of increased availability of factor products.
Vancomycin is a glycopeptide antibiotic that should be reserved to treat gram positive infections such as methicillin resistant staphylococcus aureus (MRSA). Vancomycin is a time-dependent antibiotic that relies on time over the minimum inhibitory concentration (MIC) for its efficacy. However recent data has shown better bacterial killing power in area under the curve (AUC)/MIC compared to time over the MIC.

Current vancomycin therapeutic guidelines recommend that trough levels be used as surrogate markers to achieve a targeted AUC/MIC of > 400 for patients with a MIC of 1 mg/L. Although trough based monitoring has been used as standard practice, variability in individual patient kinetics can lead to variance in AUC/MIC levels.

The primary objective of this study is to review patients who had a positive MRSA culture and who received vancomycin therapy. The patient's empiric dose and trough data will be reviewed and utilized to perform AUC calculations as well as used to determine whether the patient developed any vancomycin related toxicities.

The conclusions derived from the data collected in this study along with current AUC/MIC literature will be used to create and further improve UnityPoint Health Des Moines' vancomycin dosing, including the development of an updated collaborative practice agreement regarding dosing and monitoring of vancomycin.

Learning Objective:
Utilize an AUC/MIC vancomycin empiric dosing nomogram to increase both safety and efficacy of vancomycin dosing throughout the health system.

The direct oral anticoagulants (DOACs) affect various laboratory values traditionally used to titrate unfractionated heparin (UFH) infusions including both activated partial thromboplastin time (aPTT) and heparin anti-Xa. Currently, there exists only a limited amount of literature to help healthcare providers determine a safe and efficacious plan when patients require a transition from one of the DOACs to a continuous UFH infusion. Much of the present debate surrounds whether to use aPTT or heparin anti-Xa laboratory values to monitor and titrate the continuous UFH infusion.

The objective of this project is to close the current knowledge gap and identify how providers at Sanford USD Medical Center have historically managed patients taking rivaroxaban or apixaban who required transition to a continuous UFH infusion.

This project will be a retrospective chart review of patients who were actively taking rivaroxaban or apixaban immediately prior to the UFH continuous infusion between November 4, 2011 and October 31, 2017. Patients who meet inclusion and exclusion criteria will be separated into two groups based on which laboratory values were used to monitor and titrate the UFH infusion: 1) aPTT levels; 2) heparin anti-Xa levels. A secondary investigation will separate patients based on whether rivaroxaban or apixaban anti-Xa levels were used during the transition period. Each group within the primary and secondary investigation will have outcomes recorded for incidence of bleeds and thrombi, number of UFH infusion rate changes, and number of unplanned UFH infusion holds due to elevated laboratory values.

Results will be presented at the conference.

Learning Objective:
Recognize the different options available to monitor and titrate a continuous unfractionated heparin infusion when a patient uses rivaroxaban or apixaban.
Antibiotic stewardship plays an essential role in reducing unnecessary antibiotic resistance to our finite pool of antibiotics. However, to date there is little concrete evidence to support an optimal antibiotic stewardship strategy. One method of improving antibiotic stewardship proposed in recent years is the use of antibiotic time-outs. Utilization of antibiotic time-outs has been recommended by the Infectious Disease Society of America (IDSA), The Joint Commission, and the Centers for Disease Control (CDC). Utilization of a pharmacist-facilitated antibiotic time-out provides a potential opportunity for improved antibiotic stewardship. The objective of this study is to assess the impact of pharmacist-initiated antibiotic time-outs at 48 hours of empiric antibiotic therapy on total days of empiric antibiotic therapy. As a pre/post quality improvement project, randomly selected non-intervention patients meeting inclusion criteria will be compared to patients who have had an antibiotic time-out implemented during their hospital stay. Interventional patients will be identified through the use of an EPIC best practice alert that triggers when patients have been on an IV antibiotic for at least 48 hours. The intervention will be a notification to the ordering provider that empiric antibiotics have been in place for 48 hours along with all relevant clinical information to determine if there is an active infection and is optimal antibiotic therapy currently being utilized.

Results of this study will be used to guide improvement in the current antibiotic stewardship process at United Hospital to ensure optimal antibiotic utilization.

**Learning Objective**
The objective of this study is to determine the impact of pharmacist-initiated antibiotic time-out at 48 hours of empiric antibiotics on total days of empiric antibiotics at a community hospital with an established antibiotic stewardship program.
Intravenous lipid emulsions are a risk factor for parenteral nutrition associated liver disease (PNALD) in the neonatal population. Current literature supports the use of SMOFlipid, a fish-oil based lipid emulsion, for the reversal of PNALD. The purpose of this study is to assess the safety of SMOFlipid for parenteral caloric intake in neonates, compared to Intralipid (soybean based lipid emulsion), by measuring the development of PNALD and other adverse effects.

This is an observational cohort, comparative safety study, conducted in the neonatal nursery at Wesley Children’s Hospital. Subjects include patients who received SMOFlipid or Intralipid in their parenteral nutrition formula. Data will be collected prospectively for patients receiving SMOFlipid and compared to historical data of patients who received Intralipid, subjects will then be matched in a 1:3 fashion (SMOFlipid:Intralipid) based on gestational age and birth weight (±50 grams). The primary outcome of this study is the presence of PNALD, defined as a direct bilirubin >2 mg/dL, after the start of parenteral nutrition. Secondary outcomes include the occurrence of adverse events from the lipid emulsions, changes in liver function tests from baseline, and the impact of different conditions on patient outcomes (low birth weight, modified inflammatory processes, sepsis and the use of hepatotoxic medications). Sample size of 684 subjects was calculated assuming an alpha of 5% and power of 80% for statistical analysis.

Results are pending for this research project, but it is hypothesized the incidence of PNALD will be less in the SMOFlipid group.

Learning Objective:
Discuss the incidence of parenteral nutrition associated liver disease in neonates who received SMOFlipid versus Intralipid.
Multiple myeloma (MM) has been argued to be incurable with autologous stem cell transplant (SCT), but with newer agents that prolong progression-free survival (PFS), curability is now controversial. The National Comprehensive Cancer Network currently recommends either lenalidomide or bortezomib as maintenance therapy post-SCT to aid in prolonging PFS. However, it is still unknown whether one maintenance regimen is superior in efficacy or tolerability. A retrospective, single-center, IRB-approved, chart review of MM patients that received an autologous SCT and maintenance therapy at the University of Kansas Health System was conducted. The primary objective of this study was to determine the 2-year PFS in MM patients receiving bortezomib maintenance therapy compared to lenalidomide maintenance therapy. Secondary objectives included: 1) overall survival (OS), 2) percentage of patients who discontinued therapy due to toxicity, 3) PFS in patients receiving continuous versus interval dosing of lenalidomide.

One hundred and forty-nine patients were included in the final analysis, of which 94 received lenalidomide and 55 received bortezomib. Median PFS was 33.4 months in the lenalidomide arm and 37.1 months (p=0.77) in the bortezomib arm. Mean OS was 7.9 years in the lenalidomide arm and 4.9 years (p=0.07) in the bortezomib arm. There were significantly higher rates of discontinuation due to toxicity in the lenalidomide arm. No significant differences were seen in PFS in patients receiving continuous or interval lenalidomide. The results of this retrospective study support the need for further prospective studies to assess superiority of either maintenance regimen in MM patients post-SCT.

Learning Objective:
Determine if maintenance regimen has an impact of progression free survival in multiple myeloma patients post-transplant.
EVALUATION OF THE EFFECTIVENESS OF A STAPHYLOCOCCUS AUREUS BACTEREMIA TREATMENT CHECKLIST

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Staphylococcus aureus bacteremia (SAB) has become an increasingly difficult to treat infection. A SAB management checklist was developed and approved for use within the Allina Health system in August 2015. This study aims to evaluate Staphylococcus aureus bacteremia (SAB) management after implementation of the checklist.

A retrospective review was conducted on 50 patients with SAB from 12 Allina Health hospitals. SAB management was appropriate if the provider adhered to a guideline derived four-part bundle, which included: repeat blood cultures, echocardiography, correct antibiotic/route selection, and appropriate antibiotic duration. Secondary outcomes were in-hospital all-cause mortality, 30-day readmission, and method and timing of imaging.

Of the 48 patients included in the final analysis, 38 (79%) were bundle compliant. The most common reason for missed bundle compliance was an abbreviated duration of antibiotic therapy (n=5) or inappropriate antibiotic selection (n=4), though incorrect or omitted imaging occurred in three cases. Four patients were discharged on oral antibiotics and were deemed inappropriate per the study criteria, though were on appropriate antibiotics while inpatient. Infectious diseases providers were consulted on 46 of 48 patients (96%).

Compliance to an evidence based treatment bundle remains consistent with a previous analysis within this hospital system, despite an increase in cases with an ID provider consulted. Imaging, repeat blood cultures, antibiotic selection, and antibiotic duration of treatment all improved over the interval. Most patients in this study were at metro hospitals and further efforts should be directed towards regional hospitals in the hospital system.

Learning Objective:
Identify important components of SAB management and how they improved with development of a treatment checklist.

EVALUATION OF PEDIATRIC VANCOMYCIN DOSING AND THE ROLE OF THE PHARMACIST

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Pharmacokinetic and pharmacodynamic properties change as a child ages, leading to difficulty obtaining therapeutic concentrations of medications such as vancomycin. Recent data shows that common empiric vancomycin regimens of 40-60 mg/kg/day are not adequate to obtain therapeutic levels in the majority of patients which results in under-dosing and higher costs. Given the complicated pharmacokinetics involved with this drug, the pharmacist can play a critical role in evaluating and customizing dosing and monitoring parameters. This study will investigate the appropriateness of current vancomycin dosing in pediatric patients and look for opportunities for evidence-based practice improvements.

A report was generated using Epic to include pediatric patients (age 0-17 years) who received IV vancomycin between 1/1/2015 to 12/31/2017. Patients were excluded if they did not have a vancomycin trough level. A spreadsheet will be organized using Microsoft Excel to populate relevant data about patient demographics and vancomycin dosing and monitoring parameters. Results will evaluate if vancomycin troughs are therapeutic or not as well as if the pediatric dosing followed current recommended guidelines.

The results of the study will be used to propose a pharmacist-driven protocol for vancomycin dosing and monitoring in pediatric patients at Stormont Vail Health.

Learning Objectives:
Identify areas to improve vancomycin dosing in the pediatric population
Discuss the potential benefits from optimizing the role of a clinical pharmacist in dosing and monitoring vancomycin in pediatric patients
MILRINONE IN PATIENTS WITH END-STAGE RENAL DISEASE (ESRD) AND ACUTE KIDNEY INJURY (AKI) Derek Sprang, Matthew Lillyblad, Abbott Northwestern Hospital, 800 E 28th St, Minneapolis, MN 55407. derek.sprang@allina.com

Milrinone is a phosphodiesterase type 3 inhibitor used in the treatment of heart failure due to its ability to increase cardiac index and decrease left ventricle filling pressure. It has been recommended by the manufacturer that milrinone be dose adjusted based on renal function, however throughout Abbott Northwestern this recommendation is generally not followed. Potential consequences of not following this recommendation include supratherapeutic levels of milrinone, tachyarrhythmias, and hypotension. Current studies have shown serum levels of milrinone to be inversely related with creatinine clearance but no studies have looked at the clinical consequences of a supratherapeutic level.

The purpose of this study is to determine if not following the manufacturer’s renal dose adjustment recommendation leads to an increase incidence of significant hypotension or significant dysrhythmia.

Through an observational chart review examining patients prescribed milrinone in Abbott Northwestern’s intensive care unit (ICU) from January 1, 2015 to December 31, 2017 it will be assessed whether patients experienced an increased incidence of significant hypotension, defined as a MAP < 60 or vasopressor initiation or an increased incidence of significant dysrhythmia, defined as HR > 150 bpm, new IV anti-arrhythmic initiation, direct cardioversion, or cardiac arrest, if the manufacturer’s dosing recommendations were not followed. The results of this project could impact patients, prescribers, and our institution as a whole through altering the prescribing practice of milrinone to prevent any additional adverse effects by decreasing the use of unnecessary resources and patient length of stay through better outcomes.

Learning Objective:
Explain the clinical consequences of not dose adjusting milrinone based on renal function in patients with end-stage renal dysfunction or acute kidney injury

REAL TIME AND COST EVALUATION OF MEDICATION SHORTAGES AND EFFECTS ON PATIENT CARE IN AN ACADEMIC MEDICAL CENTER Chelsea Stallings; Michael Huke; Travis Myer; Allison Dodson. Truman Medical Centers, 2301 Holmes Street, Kansas City, MO 64108. Chelsea.Stallings@tmcmed.org

Medication shortages are not always easily solved and often require a significant amount of time on behalf of the pharmacy department to limit potential impact on patient care. Both the Food & Drug Administration and the American Society of Health-System Pharmacists track medication shortages on an ongoing basis, yet there have been few studies that look at medication shortages on a local or institutional level.

This study aims to investigate and better understand how our pharmacy department manages medication shortages in order to realize the 1) precise time spent on medication shortages, 2) the true cost of medication shortages (both direct and indirect), and 3) the impact medication shortages have on our patients.

Time, cost, and perceived impact on the patient due to medication shortages will be evaluated daily over a 4 month period with our management team and buyers for the corporation. Time will be measured in hours and broken down by each step of the medication shortage process. Cost measurements will include the cost difference between the new drug ordered and usual drug ordered as well as labor costs for dealing with the shortage. Impact on the patient will be categorized as mild, moderate, or severe based upon previously specified criteria.

The results of this study will be used to better understand our medication shortage processes. We hope to use this information to make them more efficient and cost effective, and determine if additional resources should be allotted to the existing processes.

Learning Objective:
Identify how medication shortages may lead to medication errors in the health care system.
EVALUATION OF THE ACCURACY OF LOW MOLECULAR WEIGHT HEPARIN-CALIBRATED ANTI-XA LEVELS AS A SURROGATE MARKER TO MEASURE RIVAROXABAN AND APIXABAN ACTIVITY  

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Determination of plasma rivaroxaban and apixaban concentrations may be necessary in certain clinical situations, such as impaired renal or hepatic function. Rivaroxaban and apixaban concentrations can be accurately and rapidly obtained, however, there are currently no Food and Drug Administration (FDA)-approved rivaroxaban or apixaban calibrators available in the United States. Only a few laboratories across the U.S. provide these concentrations on a research-use only basis. Knowledge as to whether the widely available heparin-calibrated anti-Xa assays can accurately assess rivaroxaban or apixaban may be of clinical value.

The purpose of this study is to continue to explore the relationship and determine the accuracy of a low molecular weight heparin calibrated anti-Xa assay as a surrogate marker of rivaroxaban and apixaban activity in subjects taking these medications for the treatment of venous thromboembolism (VTE) or non-valvular atrial fibrillation.

The objective will be assessed by obtaining informed consent from eligible patients to collect a sample of blood. The blood sample will be used to obtain a low molecular weight heparin-calibrated anti-Xa level and a rivaroxaban or apixaban plasma concentration. Descriptive statistics will be calculated to analyze the relationship between the two lab results to see if a correlation exists.

Preliminary results of this study have shown that a correlation may exist; however, power has yet to be obtained. The final results of this study may help guide clinical decisions regarding rivaroxaban and apixaban monitoring in certain situations to optimize patients' therapy and safety.

Learning Objective:

1) Explain the value a surrogate marker would have to measure rivaroxaban and apixaban activity in certain circumstances.

EARLY IDENTIFICATION OF SEPTIC PATIENTS AND TIMING OF ANTIBIOTIC ADMINISTRATION AFTER SYSTEM AND PROCESS RE-DESIGN AT AN ACADEMIC MEDICAL CENTER'S EMERGENCY DEPARTMENT  

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The Society of Critical Care Medicine and Surviving Sepsis Campaign define sepsis as the presence (probable or documented) of infection with systemic manifestations. Severe sepsis is defined as sepsis with evidence of new organ dysfunction and/or tissue hypoperfusion. Whereas septic shock is defined as sepsis-induced hypotension (systolic blood pressure (SBP) less than 90 mmHg or mean arterial pressure (MAP) less than 70 mmHg) despite adequate fluid resuscitation. Severe sepsis and septic shock are associated with high mortality rates. Timeliness and appropriateness of initial therapy has been shown to potentially improve outcomes.

The Centers for Medicare and Medicaid Services (CMS) and The Joint Commission sepsis core measures were implemented October 2015 and require hospitals to meet a 96% compliance rate with all of the following sepsis core measure items: Patients experiencing septic shock - within three hours of presentation (serum lactate, blood cultures, appropriate empiric antibiotics, adequate fluid resuscitation with 30 mL/kg bolus).

Currently, sepsis and related complications are the leading cause of mortality at Nebraska Medicine. The ED is where a large percentage of patients are first diagnosed with sepsis; however, the ED is not currently meeting the CMS goals in regards to the three and six hour sepsis core measures.

Through the addition of an Epic ED RPh Trackboard column alerting the ED pharmacists to patients meeting SIRS criteria (systolic BP < 90 mmHg AND lactic acid ≥ 2), the aim of the project is to improve early identification of true septic patients and thereby improve compliance with CMS Sepsis Core Measures.

Learning Objective:

1) Explain the importance of the early identification of septic patients in the emergency department.
RATES AND APPROPRIATE JUSTIFICATION OF ANTIPSYCHOTIC POLYPHARMACY IN A 100-BED MENTAL HEALTH UNIT Shelby Storsveen, Kimberly Sundling, Pamala A. Pawloski, Regions Hospital, 640 Jackson Street, St. Paul, MN 55101. Shelby.N.Storsveen@healthpartners.com

Antipsychotic monotherapy is the treatment of choice for patients with schizophrenia. The 2010 American Psychiatric Association Schizophrenia guidelines only support the augmentation of clozapine with an additional antipsychotic. Interestingly, in practice, the majority of patients discharged on antipsychotic polypharmacy are not discharged on clozapine. Appropriate justification for antipsychotic polypharmacy is defined by the 2008 Joint Commission's hospital-based inpatient psychiatric services (HBIPS) core measures as: 1) failed at least three different trials of antipsychotic monotherapy; 2) documentation containing a plan to taper to monotherapy; or 3) one of the antipsychotics utilized is clozapine. The most recent national average for multiple antipsychotic prescribing was 11.6% in 2015, with an appropriate justification rate of 63.1%. In 2016, 1,734 patients from Regions Hospital Mental Health Unit were discharged on scheduled antipsychotics. Of these, 237 (13.7%) patients were discharged on multiple antipsychotics, and the rate of appropriate justification was unknown.

The purpose of this quality improvement study is to evaluate the rate of patient records containing appropriate provider justification for the prescribing of multiple antipsychotics at discharge from Regions Hospital before and after a pharmacist-driven education with provider-specific feedback. These objectives will be met through retrospective chart review before and after pharmacist-driven education.

The results of this study will be used to inform mental health providers and administration about the appropriate use and justification of antipsychotic polypharmacy at Regions Hospital.

Learning Objective:
To describe the rate of antipsychotic polypharmacy and rate of appropriate justification for antipsychotic polypharmacy, as well as assess methods to improve antipsychotic polypharmacy prescribing.

ASSESSING THE ADDITION OF THIAMINE AND VITAMIN C TO HYDROCORTISONE FOR THE TREATMENT OF SEVERE SEPSIS AND SEPTIC SHOCK Lauren Stratton, Jennifer Marquart, James Bischoff, 3300 Oakdale Ave N. Robbinsdale, MN, 55422. Lauren.stratton@northmemorial.com

Reducing the mortality rates of patients with severe sepsis remains a challenge for the medical community. The Surviving Sepsis Campaign guideline recommends the use of hydrocortisone when hemodynamic stability is not achieved with adequate fluid resuscitation and vasopressors in the setting of severe sepsis and septic shock. While hydrocortisone use in this patient population is controversial, recent literature suggests that adding vitamin C and thiamine to hydrocortisone may reduce mortality rates. This study's purpose is to evaluate if adding thiamine and vitamin C will reduce mortality in the group of patients who do receive hydrocortisone.

The primary outcome in this study is mortality during hospitalization. Secondary outcomes include hospital length of stay, intensive care unit length of stay, ventilator days, and duration of vasopressors.

Patients admitted from December 2017 through April 2018 with severe sepsis or septic shock that are started on hydrocortisone will also be given thiamine and vitamin C. The treatment group will be compared to a control group of patients from December 2016 through April 2017 that presented with severe sepsis or septic shock requiring hydrocortisone. Inclusion criteria is age greater than 18 years, hospitalization in the intensive care unit, and a diagnosis of severe sepsis or septic shock requiring hydrocortisone.

Preliminary results show hospital mortality at 33.3% (3 of 9) in the treatment group compared to 29.4% (15 of 51) in the control group. Data collection completion and statistics are still in progress.

Learning Objective:
Identify the mortality benefit of adding thiamine and vitamin C to hydrocortisone in the setting of severe sepsis or septic shock.
IMPLEMENTATION OF A PHARMACIST FACILITATED DISCHARGE MEDICATION REVIEW Alexandria Stringberg, David Wolfrath, Sarah Cox, Namrita Trivedi, Megan Nicklaus, Laura Butkievich, University of Missouri Health Care, One Hospital Drive, Columbia, MO 65212. Stringberga@health.missouri.edu

It is estimated that more than 60% of medication errors occur during transitions of care. These errors lead to hospital readmissions, poor patient outcomes, and lower reimbursement rates for hospitals. The purpose of this study was to evaluate the number of medication errors prevented following implementation of a pharmacist discharge medication review. All patients admitted to University Hospital under the care of a decentralized pharmacist between December 2017 and March 2018 were included. Patients were excluded if <18 years old, a prisoner, discharged prior to medication review, or left against medical advice.

The pharmacist discharge medication review program was led by decentralized pharmacists and began once discharge orders were placed for a patient. Pharmacists reviewed discharge medications for duplication of therapy, renal or hepatic dose adjustments and drug-drug interactions. Appropriateness of drug therapy was assessed based on patient age and comorbidities. Physicians accepted or denied pharmacist recommendations and amended the discharge medication list accordingly. Pharmacists then reviewed the revised discharge medication lists and documented the identified medication errors and interventions. The primary outcome of the study was the number of medication errors identified upon discharge. Secondary outcomes included percentage of patients with pharmacist-reviewed discharge medication orders, type and number of medication errors per patient, percentage of interventions accepted by physicians, and 30-day all-cause readmission rate.

Study results will be analyzed using descriptive statistics. Preliminary results indicate that the implementation of a pharmacist discharge medication review could improve patient care by reducing the number of potential medication errors.

Learning Objective:
Summarize the process of implementing a pharmacist facilitated discharge medication review

EFFECT OF AN ORAL GLUCOSE GEL PROTOCOL ON NEONATAL INTENSIVE CARE UNIT ADMISSIONS Hailey Sullivan, Tammy May, Megan Troutman, Via Christi Hospitals Wichita, Inc., 929 North Saint Francis St, Wichita, KS 67214. hailey.sullivan@ascension.org

The American Academy of Pediatrics and the Pediatric Endocrine Society recommend administration of intravenous (IV) dextrose as first-line treatment for neonatal hypoglycemia. At Via Christi Hospitals Wichita, Inc. (VCHW), admission to the neonatal intensive care unit (NICU) is required for administration of IV dextrose, exposing neonates to several potential risks and increasing overall health care costs. Literature suggests oral glucose gel is a safe and effective alternative to IV dextrose.

The primary objective of this retrospective chart review is to evaluate the impact of an oral glucose gel protocol on the rate of NICU admissions in neonates treated for moderate hypoglycemia. Secondary objectives include: comparison of the number of oral glucose gel doses administered, resolution of moderate hypoglycemia, and duration of NICU stay.

This study will include neonates identified by documented blood glucose levels. The control group will include neonates who received IV dextrose. The comparison group will include neonates who received oral glucose gel. Exclusion criteria include admission to the NICU for any reason other than hypoglycemia. All continuous data will be compared using the student’s t-test and all discrete data will be compared using the chi squared test.

The results of this study will be used to validate the effectiveness of the oral glucose gel protocol at VCHW and to provide education to ensure optimal outcomes for neonates with hypoglycemia.

Learning Objective:
Recognize the potential treatment options for neonatal hypoglycemia
LIRAGLUTIDE USE WHEN COMBINED WITH INSULIN THERAPY IN VA PHARMACIST-RUN DIABETES CLINIC Melissa Sutton, Lisa Bilslend, Justin Frazer, VA Nebraska-Western Iowa Health Care System, 2201 N Broadwell Ave, Grand Island, NE 68803. Melissa.Sutton2@va.gov

Liraglutide has more commonly been used in practice since the 2017 American Diabetes Standards of Care recommend a glucagon-like-peptide-1 receptor agonist (GLP-1 RA) if glycated hemoglobin (HbA1c) is not controlled on basal insulin alone. The primary objective of this project was to determine how pharmacists adjust insulin therapy at initiation of liraglutide, as there is little guidance. This retrospective quality improvement project included patients prescribed liraglutide and insulin concurrently through pharmacy clinics at Veterans Affairs Nebraska Western Iowa Health Care System (VA NWIHCS) from December 2016 through July 2017. Existing prior authorization drug requests for liraglutide were used to obtain patient records for review. Glycated hemoglobin, weight, total daily insulin dose, and side effects were assessed 12 weeks prior to liraglutide initiation, at baseline, and at follow up visits after 2, 4, 6, and 12 weeks. Percentage of basal and bolus insulin reduction upon initiation of liraglutide was also collected.

During the project timeframe, 124 patients were initiated on liraglutide. Upon initiation basal insulin was reduced by an average of 4%; bolus insulin doses were reduced by an average of 52%. Average HbA1c at baseline was 8.8%. After 12 weeks, HbA1c decreased to 8.1%. Seven percent of patients discontinued liraglutide due to gastrointestinal side effects. Average weight loss at 12 weeks was 2 kg.

There was a consistent percent reduction in basal insulin, but wide variation in percent reduction in bolus insulin. Additional guidance is needed for a consistent approach to adjusting complex insulin regimens upon initiation of liraglutide.

Learning Objective:
Determine the average percent reduction in bolus insulin at the initiation of liraglutide

INCIDENCE OF ACUTE KIDNEY INJURY FROM COMBINATION THERAPY OF VANCOMYCIN AND PIPERACILLIN-TAZOBACTAM Nathan Sylvain, Julie Haase, Janice Bueter, Southeast Hospital, 1701 Lacey St. Cape Girardeau, MO 63701. nsylvain@sehealth.org

Acute kidney injury (AKI) is associated with increased morbidity, mortality, hospital length of stay, and costs. There is evidence in the literature suggesting an increased risk of AKI during vancomycin therapy. Increases in doses of vancomycin, target trough concentrations, and duration of therapy may be responsible for the observed rates of AKI in patients treated with vancomycin. This risk can be increased even further with concomitant use of nephrotoxic agents and the presence of comorbid conditions. Several studies in recent years have shown evidence of increased rates of AKI with combination therapy of vancomycin and piperacillin-tazobactam. Given the negative effects of AKI and the widespread use of these antibiotics, concomitant use of vancomycin and piperacillin-tazobactam could have significant impacts on patient outcomes.

The purpose of this study is to determine the incidence of AKI in patients at Southeast Hospital that are treated with concomitant vancomycin and piperacillin-tazobactam. Data was collected from retrospective chart reviews of patients that were admitted to the hospital from January 2017 through June 2017. Patients that were administered concomitant vancomycin with either cefepime or aztreonam were used as a comparator group. Discrete data will be analyzed using Chi-squared test and continuous data will be analyzed using Student’s t-test.

Results of this study will provide evidence for or against an association between AKI and vancomycin and piperacillin-tazobactam use at Southeast Hospital and if prescriber vigilance should be used when initiating combination therapy.

Learning Objectives:
Define AKI according to Kidney Disease: Improving Global Outcomes (KDIGO) guidelines
Identify the negative consequences of AKI.
Interpret results of a study at a community hospital examining rates of AKI with concomitant use of vancomycin and piperacillin-tazobactam.
AN EVALUATION OF THE IMPACT OF TRANSITIONING TO A PAPERLESS WARFARIN MONITORING SYSTEM Andrew Tarleton, Christina Askew, Jacob Langness, Choua Xiong. Abbott Northwestern Hospital, 800 E. 28th Street-MR 11321, Minneapolis, MN 55407-3799. Andrew.Tarleton@allina.com.

The dosing and monitoring of inpatient warfarin anticoagulation therapy is currently managed by a multidisciplinary team of providers and pharmacists at our institution. The involvement of pharmacists in providing coordinated inpatient warfarin dosing has been demonstrated to reduce excessive anticoagulation and decrease the length of stay. With the current workflow, the provider enters an order for a Pharmacy to Dose-Warfarin Consult into the electronic medical record (EMR). The pharmacist then receives the order and documents all of the pertinent monitoring parameters on a paper monitoring form. This information is then re-entered into the EMR in the form of a daily progress note along with ordering the corresponding dose and relevant lab orders. This process results in duplicate documentation and creates inefficiencies in the overall workflow. The creation of additional monitoring tools within the EMR would eliminate the need for paper consult forms and may also increase patient safety by reducing the number of missed warfarin consults.

The purpose of this study is to assess the potential impact of transitioning to a paperless warfarin monitoring system within a large quaternary care center. A series of time studies will be conducted in order to determine the total time needed to reconcile the paper monitoring forms and to assess the total time needed to complete a newly ordered warfarin consult. A retrospective patient and visitor safety report (PVSR) of warfarin related safety events will be generated to determine the most common errors associated with warfarin therapy. Finally, once the paperless warfarin monitoring system has been implemented, the same assessments will be repeated to determine the impact of the change in workflow.

Learning Objectives:
Evaluate the current warfarin management service workflow for hospitalized patients receiving warfarin anticoagulation.
Identify potential barriers to implementing a paperless warfarin monitoring system and ways one can work to overcome those challenges.

IMPACT OF SINGLE IV DOSE ANTIBIOTIC ON OUTCOMES FOR PATIENTS DISCHARGED FROM THE EMERGENCY DEPARTMENT ON ORAL ANTIBIOTICS Michael Thiefault, Jessica Nesheim, Kelly Percival, Mercy Medical Center, 1111 6th ave, Des Moines, IA 50314 mthiefault@mercydesmoines.org

Administering a single dose of intravenous antibiotics before emergency department discharge is common practice among some physicians, this stems from expert opinion and is not supported by high quality literature. Physicians believe giving a single dose of intravenous antibiotic makes them feel like they are doing something for the patient before discharge and gives them more time to observe the patient. Also, patients tend to believe more is being done for them when they receive an antibiotic intravenously compared to orally. There is limited literature supporting this practice, and little literature discussing the issue or parental loading doses before discharge. Many oral antibiotics have good bioavailability, which questions if there is a benefit to giving a one-time intravenous dose. The purpose of this study is to determine if there is any difference in outcomes between patients that received a single-dose IV antibiotic before discharge compared to oral antibiotic therapy in patients that are deemed stable to be discharged from the emergency department on oral antibiotics.

This retrospective study will analyze patient data and outcomes who have received IV and oral antibiotics in the ED and then discharged home or to a facility. Data will be collected by query of medical records on patients from August 1st 2016 to August 1st 2017. We hypothesize that there will be no difference in outcomes between the two groups.

Learning Objective:
Determine the utility in the use of a single-dose IV antibiotic before discharge compared to oral antibiotic therapy in patients that are deemed stable to be discharged from the emergency department on oral antibiotics.
DEVELOPMENT, IMPLEMENTATION AND ASSESSMENT OF INTERVENTIONS DESIGNED TO REDUCE INTRAVENOUS ACETAMINOPHEN USAGE AT PARK NICOLLET METHODIST HOSPITAL

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Intravenous (IV) acetaminophen is currently sixth on Park Nicollet Methodist Hospital’s drug expenditure list. Through collaboration with the Pain Committee and Pharmacy and Therapeutics Committee (P&T) IV acetaminophen usage is limited to surgical patients who have a contraindication to ketorolac use and are unable to take anything by oral route (NPO). A Medication Use Evaluation of IV acetaminophen (10/1/16 – 10/31/16) determined that only 17.9% of IV acetaminophen orders met all three P&T approved criteria.

The purpose of this project is to evaluate interventions designed to reduce the current IV acetaminophen drug expenditure by limiting its usage to P&T approved indications.

A series of pharmacist lead interventions including the addition of a pop-up alert in the electronic medical record, nursing education, newsletter articles and prescriber education were completed. Baseline data and intermittent data on IV acetaminophen usage and adherence to P&T approved criteria was collected to assess the implemented interventions. Patients who received IV acetaminophen during their admission at Park Nicollet Methodist Hospital were identified. Retrospective chart reviews were preformed to determine compliance to P&T approved criteria. Compliance to approved criteria was also broken down by prescribers and their respective practice groups.

Intermittent results collected 10/1/17-10/14/17 have shown an increase in orders meeting all three approved criteria for use. Compared to 17.9% at baseline (10/1/16 – 10/31/16), 26% of orders met approved criteria during this two week collection. It is anticipated that adherence will increase after low compliance physician groups are identified and educated.

Learning Objective:
Identify strategies, initiated by pharmacists, to reduce IV acetaminophen drug expenditure.

EVALUATION OF HEPARIN INDUCED THROMBOCYTOPENIA USING PROBABILITY SCORES IN A MECHANICAL CIRCULATORY SUPPORT POPULATION

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Patients on both temporary and long term mechanical circulatory support (MCS) devices carry a high risk for thrombocytopenia, with reports of up to 40-60% demonstrating a significant decrease in platelet counts. Due to the routine use of heparin and increased risk of thrombocytopenia, heparin induced thrombocytopenia (HIT) is frequently suspected in patients receiving MCS. HEP and 4T scoring tools are pre-test clinical scores that have been developed to identify the probability of HIT diagnosis and been validated in patient populations who have a predictable decline in platelet counts. This descriptive study seeks to assess the association of 4T and HEP scores to available HIT diagnostic tests in patients requiring MCS.

Patients requiring MCS on pharmacy managed heparin anticoagulation protocols (IABP, Impella, and LVAD) in the ICU will be evaluated for heparin PF4 antibody optical density (OD) and/or serotonin release assay (SRA) results. A 4T and HEP score at the time of heparin antibody ordering will be calculated using variables required for each scoring system. Utilizing previously described ranges for heparin PF4 antibody and SRA tests in HIT diagnosis, patients will be categorized into two HIT probability categories: probable and not probable. Descriptive statistics will be provided for 4T and HEP scores in both HIT probability categories.

Through this study, we hope to validate the use of 4T and HEP scores to assess the probability of HIT in patients requiring MCS devices.

Learning Objective:
Describe the association of 4T and HEP scores to available HIT diagnostic tests in patients requiring MCS.
Inappropriate inhaler regimen upon hospital discharge for a patient with chronic obstructive pulmonary disease (COPD) is a risk factor for 30-day hospital readmission. Hospital readmission rates significantly contribute to healthcare costs and COPD is a contributor to this problem. The Global Initiative for Chronic Obstructive Lung Disease (GOLD) Report was updated in 2017 with a new approach to individualize patient’s therapy, and pharmacists are ideal candidates to assess patient’s treatment therapy.

The purpose of this study is to examine the effects of pharmacist participation in optimizing COPD patient inhaler therapy prior to discharge and the impact on 30-day readmission rates. Statistics will be calculated using a Chi-square analysis to compare the two groups.

The pharmacist’s process include placing a note for the provider on top of the patient’s chart who have a history of COPD and an admission related to COPD. The note consists of the patient’s admission reason, inhaler regimen prior to admission, and a place for the provider to indicate the plan for inhaler therapy upon discharge. The pharmacist performs a drug review of the patient’s inpatient and home medication lists to make recommendations based on the classification of COPD, inhaler therapy at discharge, and the patient’s medication insurance coverage. The pharmacist works with the provider and care manager to assure that patients have goal-directed therapy at discharge.

The results of the study will be used to continue pharmacist involvement as an integral member of the COPD readmission team to improve patient care and reduce COPD readmission rates.

**Learning Objective:**
Discuss the importance of pharmacist involvement in decreasing COPD readmission rates
THE CLINICAL IMPACT OF INTRAVENOUS CALCIUM UTILIZATION IN HYPERKALEMIA Sahar F. Torabi, Eli N. Deal, Christina K. Anderson, William B. Call, Barnes-Jewish Hospital, 216 S. Kingshighway Blvd Mailstop 90-52-411, St. Louis, MO 63110.
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Hyperkalemia is a commonly encountered electrolyte disturbance in hospitalized patients and carries a mortality rate as high as 30 percent. Guidelines recommend intravenous (IV) calcium for patients with hyperkalemia and EKG changes; however, its use in patients without EKG changes is less clearly defined and data in this setting are limited.

The objective of this study is to assess the clinical impact of IV calcium for the treatment of hyperkalemia without EKG changes. This is a retrospective study of patients > 18 years admitted to Barnes-Jewish Hospital between July 1, 2015 and June 30, 2016 with a serum potassium > 5.0 mEq/L within 24 hours of admission and without acute EKG changes. Patients must have an EKG obtained at time of hyperkalemia diagnosis and receive at least one potassium lowering agent or IV calcium within 6 hours. Exclusion criteria includes EKG changes consistent with hyperkalemia, hypocalcemia, or IV calcium administered at a dose or for an indication other than for hyperkalemia. Propensity score matching will be performed for the two treatment groups: those who received IV calcium and those who did not.

The primary outcome of this study is inpatient mortality. Secondary outcomes include hospital length of stay, median time to hyperkalemia resolution, normokalemia at 24 hours, 30-day mortality, and subsequent cardiac arrhythmias due to hyperkalemia. The incidence of hypercalcemia at 24 hours will be explored as a safety outcome.

Results of this trial may provide guidance for the role of IV calcium in hyperkalemia without EKG changes.

Learning Objective:
Explain current recommendations regarding the use of IV calcium in hyperkalemia.
OPioid prescribing habits between provider groups for back pain in the emergency medicine setting

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Back pain is one of the most common conditions encountered by Emergency Medicine (EM) providers. It also is one of the most difficult conditions to treat due to a host of factors, including incomplete past medical history, medication-seeking behaviors, and allergies. Opioids are commonly employed in this setting due to their rapid and powerful pain-relieving effects, however when utilized in opioid-naïve patients, there may be risk of future dependence. With an increased focus on the treatment of pain by accrediting organizations, providers must adequately control pain while being cognizant of the opioid epidemic that is occurring in the United States. Mayo Clinic has increased efforts to decrease inappropriate opioid use by developing an opioid stewardship program to ensure proper utilization of the medications in all care settings.

The number of Advanced Practice Providers (APPs), including nurse practitioners and physician assistants, staffing in EM settings continues to grow. The objective of this study is to analyze opioid prescribing activities between EM physicians and APPs in patients with acute back pain through retrospective cohort study. We anticipate increased utilization of opioids in the APP cohort when treating back pain in the EM setting. We also anticipate the APP cohort will prescribe more opioids at discharge than their physician counterparts, which could potentially lead to increased risk of future prescriptions. Results of this study may lead to improved pain management pathways and educational opportunities for EM staff.

Learning Objective:
Describe opioid utilization within the Emergency Department between provider groups in patients presenting with back pain.

Advantages of pharmacist administered long-acting injectable antipsychotics

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Nonadherence to oral antipsychotic treatment has been found to be very high in patients with schizophrenia, leading to a variety of complications. Long-acting injectable antipsychotics may help improve treatment adherence for patients with schizophrenia. Recently, long-acting injectable antipsychotic clinics have been established to aid in medication administration; unfortunately, pharmacists rarely have a leading role in these clinics. The objective of this study is to determine the advantages of a pharmacist led long-acting injectable antipsychotic clinic.

Patients will be included in the study if they are at least 18 years old and receive a long-acting injectable antipsychotic at the pharmacist-run clinic from 9/1/2017 to 2/28/2018. The primary endpoint is clinic appointment adherence. Data collection will include the average number of missed appointments and the average time it takes to make up each appointment. Hospital readmission rates will be a secondary endpoint. To determine if readmission may be due to a missed injection, primary discharge diagnosis will be documented, as well as duration of hospital stay. Another secondary endpoint will be type of interventions made by the pharmacist. This may include any of the following: number of phone calls made to patients, number of patients requiring oral antipsychotic overlap, and patient education. Additionally, program drop-out rates with reasoning why will be collected.

The results of this study will be used to quantify the pharmacy services currently offered, as well as further develop the clinic.

Learning Objective:
Identify the role of pharmacists in administration of long-acting injectable antipsychotics.
CHARACTERIZATION OF ONCOLOGY RELATED MEDICATION ISSUES IN THE EMERGENCY DEPARTMENT AMONG ONCOLOGY PATIENTS WHO RECEIVED CHEMOTHERAPY TWO WEEKS PRIOR

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Cancer patients present to the emergency department (ED) with a diverse set of symptoms that may be disease or treatment related. Symptoms associated with oncologic emergencies are often treated differently compared to non-oncologic emergencies. Initial evaluation of oncology patients and subsequent therapy in the ED are critical to patient outcomes.

The purpose of this study is to identify the most common adverse events among oncology patients at Houston Methodist Hospital ED. This is a 12-month retrospective review of 443 patients who received chemotherapy two weeks prior to the ED visit.

Preliminary results have identified dehydration, fever/neutropenia, and pain (14%, 14%, and 15% respectively) as the most common adverse events. Data collection to identify potential medication-related interventions for these adverse events is ongoing.

The potential for pharmacists to make interventions addressing these adverse events will be used to generate impact scores. The highest scoring intervention in this study will be the target for a future protocol, pharmacy consult, or order set.

Learning Objective:
Identify potential medication-related interventions for the most common adverse events among oncology patients in the emergency department.

ADHERENCE TO INSTITUTION GUIDELINES FOR THE TREATMENT OF NEONATAL ABSTINENCE SYNDROME: A RETROSPECTIVE REVIEW

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Neonatal Abstinence Syndrome (NAS) is a cluster of problems that arise in neonates after delivery due to fetal exposure to medications associated with physical dependence. Untreated NAS can cause seizures, and is associated with poor neonatal outcomes. Maternal drug use is associated with preterm labor and other complications of pregnancy. The incidence of NAS is increasing as a direct consequence of the opioid epidemic. Guidelines for treating NAS were implemented at our institution at the end of 2014. The goal of implementing the guidelines was to decrease length of therapy, decrease length of stay, and reduce discharges home on opioid therapy. Despite the implementation of these guidelines, provider adoption at our institution is perceived to be low.

The study’s purpose is to assess compliance with the NAS protocol and the impact of noncompliance on patient outcomes. A secondary purpose is to identify possible improvements in NAS patient management.

Patients admitted to the neonatal intensive care unit between November 2014 and March 2018 with either a diagnosis of NAS or treatment with the medications used for NAS were included. Finnegan scores and medication doses for each patient will be reviewed to determine the appropriateness of medication therapy according to institution guidelines. A regression model will be used to assess the relationship between total length of stay and guideline adherence score. Secondary outcome measures will be assessed with descriptive statistics.

The results of the study will be used to assess the need for implementation of an NAS treatment protocol.

Learning Objective:
Identify the need to institute a protocol for the management of neonatal abstinence syndrome.
Evolution and advancement of health care has led to an emphasis on interprofessional education and collaborative practice. Interdisciplinary rounds are a method of incorporating this into work flow. As new professionals, medical and pharmacy residents could mutually benefit from increased collaboration. Previously no inpatient pharmacy residency rotation partnered with the existing Methodist Hospital Family Medicine Residency teaching team. This provided an opportunity to implement a new rotation and study the educational benefit between multidisciplinary learners.

The purpose of this project was to develop, implement, and evaluate the impact of a clinical pharmacy rounding rotation with a medical teaching team at a community hospital. The outcomes are as follows: assess medical and pharmacy residents’ educational benefit with the new rotation, determine the most frequent type of drug related problem the pharmacy resident was involved in resolving and evaluate the impact of those interventions on medication safety, and determine effect on drug cost savings.

Resident educational benefit was measured via surveys completed by participating medical and pharmacy residents, consisting of Likert scale and free text response questions. To evaluate pharmacy resident interventions and determine their impact on medication safety, pharmacy interventions were documented in a spreadsheet, categorized into drug related problems, and assigned an impact rating of 1 through 4. Drug-related cost savings were extrapolated based on the hospital’s current acquisition cost of the drug.

Results of the study are pending, as data analysis is underway. The information will be used to rationalize further collaboration between medical and pharmacy residents.

Learning Objective: Identify methods to evaluate a clinical pharmacy rounding rotation with a medical teaching team.
TRANSITION OF CARE PHARMACIST ASSISTING IN THE MANAGEMENT OF CONGESTIVE HEART FAILURE PATIENTS TO IMPROVE TIME TO NEXT HOSPITALIZATION

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Maintaining quality of life is a continuous struggle for patients who experience frequent heart failure exacerbations. Additionally, the financial impact of each exacerbation may result in financial stress to patients from loss of working days and direct medical expenses. For the fiscal year of 2012, the estimated cost of heart failure for the United States was projected at $30.7 billion. Medication management continues to be one of the mainstays of therapy for heart failure. However, medications may frequently change, especially upon hospitalization discharge, opening the potential for medication errors to occur.

As experts in medication management, pharmacists have the potential to bridge gaps in knowledge for patients and providers from the inpatient to outpatient setting through transition of care pharmacy to decrease the frequency of exacerbations. This quality improvement study will observe whether interventions by transition of care pharmacists decrease readmission rates. Interventions may include pharmacist conducted medication histories, notes describing an inpatient course faxed to the patient’s providers, pharmacist conducted discharge medication lists faxed to a patient’s primary pharmacy, and follow-up phone calls to patients regarding medication changes, daily weight changes, and the date of their follow-up appointments.

The primary aim of this study will be to analyze pharmacist conducted medication histories and post-discharge follow-up phone calls to observe how these interventions impact 30 day readmission rates.

Results of this study may be used to increase pharmacy services at Covenant Medical Center, and may also serve to guide transition of care teams at other institutions.

Learning Objective:

1. Recognize roles a transition of care pharmacist may have to impact 30 day readmission rates.
2. Describe challenges patients with heart failure encounter once discharged from hospitalization.

A RETROSPECTIVE ANALYSIS OF PNEUMOCOCCAL PNEUMONIA OUTCOMES IN THE INPATIENT SETTING

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Pneumococcal pneumonia is one of the most common categories of pneumonia and the most common manifestation of pneumococcal disease. Per the Centers for Disease Control and Prevention (CDC), it is estimated that as many as 400,000 hospitalizations from pneumococcal pneumonia occur annually in the United States. The best way to prevent pneumococcal disease is vaccination. Currently, there are two single-dose vaccinations available that can help protect against infection with some of the most common strains of pneumococci.

The purpose of this study is to compare patient outcomes of vaccinated and non-vaccinated hospitalized patients diagnosed with community-acquired pneumococcal disease. Outcomes assessed will include septic vs. non-septic pneumococcal pneumonia, ICU length of stay, hospital length of stay, duration of mechanical ventilation, and mortality.

A retrospective electronic medical record review from patients admitted at four Omaha metro area hospitals will comprise the study group. Eligibility for enrollment will include patients 19 years and older with culture confirmation of Streptococcus pneumoniae infection and/or a positive pneumococcal urine antigen test from the community during October 1, 2016 through September 30, 2017. Discrete variables will be evaluated with descriptive statistics, and continuous variables will be evaluated using student T-test and ANOVA statistical analysis. Study results will be used to assess the impact of pneumococcal disease within our healthcare organization and help standardize an inpatient vaccine screening protocol to optimize pneumococcal vaccination rates and decrease preventable pneumococcal disease.

Learning Objective:

1. Identify CDC recommended indications for pneumococcal vaccination in adults and evaluate the outcomes between vaccinated and non-vaccinated patients admitted to CHI Health hospitals in the Omaha metro area.
COST SAVINGS AND INTERVENTIONS MADE AFTER PHARMACIST COMPREHENSIVE MEDICATION REVIEW FOR AN EMPLOYER GROUP  
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Comprehensive medication reviews (CMRs) are a billable service under the system-wide self-insured employer plan. This model may show benefit in revenue for pharmacies as well as already proven benefits for patients who receive CMRs. Furthermore, pharmacists in this study have an established relationship with providers. This improves communication between pharmacist and provider, a limitation noted in previous studies.

This study will determine the impact of and need for a CMR by pharmacists for a self-insured employer group. The primary outcome of this study is the number of pharmacist interventions made in self-insured population. Secondary outcomes will be medication cost per member and total cost avoidance after pharmacist interventions.

Learning Objective:
Describe the significance of pharmacist involvement in medication therapy management of a self-insured employer group.

INFLUENCE OF GENES INVOLVED IN THE RENIN-ANGIOTENSIN-ALDOSTERONE SYSTEM AND THE BLOOD PRESSURE RESPONSE TO ANGIOTENSIN CONVERTING ENZYME INHIBITION AND ANGIOTENSIN RECEPTOR BLOCKAGE IN HYPERTENSION  
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Hypertension (HTN) is the most common condition seen in primary care and can lead to myocardial infarction, stroke, renal failure, and death if not detected early and treated appropriately. The Eighth Joint National Committee (JNC-8) has recommended four medication classes as first-line options for initial treatment for HTN. Several genetic polymorphisms have been identified to influence the antihypertensive response to pharmacotherapy. Despite knowledge that there is a bell-curve response to pharmacotherapy, and that genetic information can improve the response to anti-hypertensive medications, no current guidelines incorporate pharmacogenetics for appropriate drug selection in HTN, possibly because the response to therapy is not monogenic.

The purpose of this study is to evaluate the impact of a genetic panel on blood pressure (BP) prediction success in response to angiotensin converting enzyme inhibitor (ACE-I) and angiotensin receptor blocker (ARB) therapy.

Patients will be included in chart review if they return a buccal swab after meeting inclusion and exclusion criteria and consenting to enrollment. Patients on ACE-I or ARB therapy will be further divided into two groups: those mathematically predicted to respond to an ACE-I or ARB and those who are not. The primary outcome is ambulatory BP changes in response to ACE-I or ARB therapy according to genes pertinent to BP regulation. The secondary outcome assesses the number of patients who maintained BP control at follow-up.

The results of this study will attempt to validate the use of a multi-gene panel incorporating the renin-angiotensin-aldosterone-system to predict response to ACE-I and ARB therapy.

Learning Objective:
Describe the impact of genetic information to predict blood pressure (BP) response to angiotensin converting enzyme inhibitor (ACE-I) and angiotensin receptor blocker (ARB) therapy.
EVALUATION OF BREAK-THROUGH FUNGAL INFECTIONS IN ACUTE MYELOID LEUKEMIA (AML) PATIENTS RECEIVING FLUCONAZOLE VS VORICONAZOLE VS POSACONAZOLE PROPHYLAXIS

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Fungal infections are common in patients with hematological malignancies, especially those with acute myeloid leukemia (AML). Due to prolonged neutropenia from chemotherapy as well as the nature of the disease, AML patients are at higher risk for developing fungal infections. Prolonged and severe neutropenia (absolute neutrophil count <500/µL) increases a patient's susceptibility to rare and potentially severe fungal infections, such as aspergillosis. Per the National Comprehensive Cancer Network (NCCN) and American Society of Clinical Oncology (ASCO) guidelines, triazoles are recommended as the first line oral agents to prevent fungal infections in these patients. Fluconazole covers most Candida species and has great efficacy value in allogeneic stem cell transplant patients. Voriconazole covers Aspergillus species in addition to the Candida species. Posaconazole is recommended as the first line antifungal prophylaxis agent in this population given its broad spectrum coverage including molds. However, there have been no studies to compare the efficacy of the three triazoles against each other.

The purpose of this retrospective chart review, single center study is to evaluate the occurrence of break-through fungal infections in AML patients receiving fluconazole, posaconazole and voriconazole prophylaxis during induction and consolidation chemotherapy. Secondary endpoints include safety, overall survival, and invasive fungal-infection free survival. Descriptive statistics will be calculated.

The results of this study will be used to improve AML patient outcomes in the hospital.

Learning Objective:
Describe the risk factors for invasive fungal infections associated with AML patients.

A RETROSPECTIVE REVIEW OF DIRECT-ACTING ORAL ANTICOAGULANT ADVERSE EFFECTS IN A COMMUNITY HOSPITAL

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Direct-acting oral anticoagulant agents (DOACs) are guideline recommended to protect patients against thromboembolic events such as stroke, deep venous thrombosis, and pulmonary embolism. DOACs have demonstrated better efficacy and safety compared to warfarin. Unlike warfarin, DOACs are prescribed in a fixed dose without therapeutic drug monitoring. Thus, concerns exist regarding the ongoing safety of these agents, particularly in patients who are low-weight, elderly, or have renal dysfunction. Patient weight, age, and serum creatinine are factors that can be used to assess appropriate dosing of these agents.

The purpose of this study is to assess factors including weight, age, and renal function in patients presenting to St. Luke’s Hospital having experienced an adverse event in relation to being prescribed a DOAC. The goal of the evaluation is to assess whether any of these specific patient factors may be contributing to an increased incidence of adverse effects with DOACs as well as assessing if these agents have been appropriately dose-adjusted according to package inserts.

This study will be a retrospective chart review and include all patients experiencing a bleeding adverse event while using a DOAC from January 2012 to October 2017 at St. Luke’s Hospital. This data will be collected utilizing anticoagulant adverse effect ICD codes and patient specific information will be gathered via chart reviews. Descriptive statistics will be performed including counts and means.

The results of the study will be used to assess whether the majority of bleeding events were produced by any particular agent or in any particular population.

Learning Objective:
Identify patient specific factors that may increase an individual’s risk of experiencing a bleeding event while taking a direct-acting oral anticoagulant (DOAC) that may require a reductions in dose.
SAFETY AND EFFICACY OF INHALED TOBRAMYCIN IN NEONATAL PATIENTS Krista Weaver, Erin Weslander, Hatice Gagne, University of Minnesota Medical Center- Fairview, 420 Delaware St SE, Mayo C-265A, Minneapolis, MN 55455. Kweaver5@fairview.org

Tobramycin inhalation (TI) provides respiratory bacterial prophylaxis for mechanically ventilated pediatric populations throughout the United States. Data on the safety and efficacy of TI is limited in the non-cystic fibrosis (CF) pediatric population. TI exhibited minimal systemic exposure and few adverse effects in CF patients younger than 5 years old, but increased tobramycin clearance in CF patients limits generalizability. Nephrotoxicity was reported in a neonatal intensive care unit (NICU) patient. TI in adult bronchiectasis decreases pseudomonas sputum concentration with variable effect on symptoms. Efficacy studies including non-CF pediatric populations are unavailable. Insufficient pediatric data reveals the need for further study of tobramycin prophylaxis as standard of care in mechanically ventilated non-CF neonatal patients.

A retrospective cohort analysis conducted at the University of Minnesota Masonic Children’s Hospital includes 25 NICU patients who received tobramycin nebulizers compared to 25 controls, with patients matched by month of admission, gestational age at birth, and birth weight.

The primary objectives are to determine the incidence of systemic absorption following TI and to evaluate the efficacy of tobramycin prophylaxis through comparison of the number of positive respiratory cultures identified. Secondary objectives include worsening renal function as indicated by serum creatinine and urine output, documented ototoxicity, effect of ventilator type and settings during tobramycin administration on systemic absorption, and efficacy of tobramycin prophylaxis in reducing antibiotic exposure measured by duration of systemic antibiotic therapy.

Results of this study will contribute to evaluation of tobramycin respiratory prophylaxis as standard of care in mechanically ventilated neonatal patients.

Learning Objective:
Review available literature on the safety and efficacy of tobramycin inhalation in pediatric patients

PROTON PUMP INHIBITOR USE AND RISK OF DEMENTIA IN THE VETERAN POPULATION Jenna Welu, Justin Metzger, Scott Bebensee, April Ahrendt, Micheal Vasek, Sioux Falls VA Health Care System, 2501 W 22nd St., Sioux Falls, SD 57105. Jenna.Welu@va.gov

Proton pump inhibitors (PPI) have become the mainstay therapy in the treatment of acid-related disorders. Due to their high potency, excellent tolerability, and generic availability, PPIs have largely replaced histamine 2 blockers for gastric problems. Since they were first released on the market, the use of PPIs has continued to rise, leading to problems with overutilization. While the short-term side-effects appear minimal, the long-term effects of PPIs are becoming a growing concern to society. Chronic PPI use is linked to increased risks of osteoporosis, pneumonia, and clostridium difficile infections. Another possible long-term risk that has been associated with chronic PPI use is dementia.

The purpose of this study is to investigate the association between PPI use and dementia in the veteran population. Secondary objectives include examination of PPI agent, duration, and dose on the risk of dementia. Exploratory objectives include the effects of PPI use on vitamin B12 levels, hemoglobin A1C levels, and body-mass index.

These objectives will be assessed through retrospective chart reviews of the VA electronic medical databases. Various statistical tests will be used to analyze the study endpoints including but not limited to chi-square analysis and linear regression. Descriptive statistics will be used to analyze baseline characteristics.

The results of this study will provide insight into dementia risk factors in the veteran population therein guiding the development of preventative measures. This study will improve understanding of the long-term effects of PPI use and allow optimization of PPI therapies to minimize harm and maximize the intended benefit.

Learning Objective:
Define the relationship between proton pump inhibitor use and risk of dementia in the veteran population.
Vancomycin is commonly used to treat infections caused by methicillin-resistant *Staphylococcus aureus* (MRSA). Various dosing strategies have been explored to maximize clinical benefit while minimizing adverse outcomes, specifically acute kidney injury (AKI). The current consensus guidelines recommend weight-based dosing using total body weight (TBW) with trough-based monitoring, however this may lead to supratherapeutic levels in obese patients. Allometrically scaled vancomycin dosing has recently shown promise in reducing the incidence of supratherapeutic levels in obese patients, potentially reducing the risk of AKI.

The purpose of this pre-post intervention study is to determine if an allometric vancomycin dosing protocol will increase the rate of target trough attainment compared to consensus guideline dosing in obese patients. This objective will be retrospectively assessed by the investigator. The results will be used to continually improve the vancomycin dosing process at SRHC.

**Learning Objective:**
Discuss the impact of an allometric vancomycin dosing protocol on the rate of target trough attainment in obese patients.

Patients have become more comfortable with receiving clinical services in a community pharmacy setting including, immunizations and medication therapy management. In addition, high accessibility, comprehensive hours, and drug expertise make community pharmacists excellent candidates to serve as travel health experts for those traveling abroad. Individuals who decide to travel internationally have a lot to prepare for and community pharmacists are well equipped to serve as a vital source of travel health information. Implementation of a travel health clinic in a community pharmacy setting will allow patients to obtain oral travel medications, vaccines, over-the-counter supplies, and counseling for travel-related risks and prevention strategies all in one visit. Our aim is to meet the healthcare needs of international travelers efficiently by streamlining information delivery and saving patients' time.

The purpose of this study is to evaluate the effect of pharmacist-led international travel consultations on patient understanding. The primary outcome of this study is to evaluate the effect of pharmacist-led travel consultations on the change in patient understanding of travel health information. Secondary outcomes will evaluate patient satisfaction as well as perceived monetary value of the service.

These objectives will be measured by questionnaires using Likert scales. A questionnaire will be administered to study participants before and after the consultation. The study outcomes will be analyzed using statistical analyses including, sign test, Student’s t-test, and descriptive statistics as appropriate.

The results of our study will demonstrate the positive impact on our patients’ health and support the continuation of pharmacist-led travel health consultations.

**Learning Objective:**
Describe the benefit of travel health information presented in a community pharmacy setting on patient understanding and satisfaction.
EVALUATION OF MANAGEMENT OF ABNORMAL URINE DRUG SCREENS IN A VETERAN POPULATION Britney Worth, James Puhl. Veterans Affairs Nebraska-Western Iowa Health Care System. 4101 Woolworth Ave, Omaha, NE 68105. Britney.worth@va.gov.

The Opioid Safety Initiative was implemented to ensure safe prescribing patterns among patients on long-term opioid therapy (LOT) in the Veterans Affairs Health Care System. One risk mitigation strategy is to obtain an annual urine drug screen (UDS) for patients on LOT. UDS orders have increased within our health care system; however, it is unclear if results are being managed appropriately. The objective of this study is to evaluate the management of abnormal UDS in a high-risk veteran population receiving LOT.

Using an external dashboard, patients prescribed ≥ 90 mg morphine equivalents of daily opioid therapy from 9/1/2016 to 9/1/2017 were identified for retrospective analysis. Patients taking LOT for cancer, palliative care, or end-of-life pain were excluded. UDS conducted within the past year were interpreted, and if abnormal, management of the abnormal test was evaluated. The following data was collected: baseline demographics, opioid regimen at time of UDS, UDS results, record of management of UDS results, opioid regimen after UDS date, and total number of UDS in analysis period. Appropriate management of abnormal UDS include, but are not limited to: discussing results with the patient, sending UDS for confirmatory testing, continuing pain management without using opioids by tapering or discontinuing opioid therapy for confirmed substance misuse, requiring more frequent follow-up, offering naloxone, and assessing the patient for substance use disorder.

Results will be used to highlight areas of improvement in practice among physicians prescribing LOT. Prescriber education will be directed at improving the management of patients with abnormal UDS.

Learning Objectives:
Identify appropriate techniques for managing abnormal UDS results.

ASSESSMENT OF URINARY ALKALINIZATION STRATEGIES WITH HIGH-DOSE METHOTREXATE ADMINISTRATION Crystal Wright, Bradley Beck, Tobias Meissner, 1325 S Cliff Ave, Sioux Falls, SD 57117. crystal.wright@avera.org

The clearance of high-dose methotrexate is greatly affected by urine pH, with an increased risk of precipitation and acute kidney injury (AKI) if the urine is acidic. Sodium bicarbonate as a continuous intravenous infusion, with or without acetazolamide, is commonly utilized to alkalinize the urine. Evidence of clinical outcomes associated with various alkalinization strategies is limited. The purpose of this study is to compare outcomes of patients receiving sodium bicarbonate at different administration rates with or without oral acetazolamide.

This retrospective study seeks to evaluate differences in clinical outcomes in patients receiving various urine alkalinization protocols during high-dose methotrexate therapy. Enrolled patients will be divided into four cohorts based on the rate of intravenous sodium bicarbonate administration and oral acetazolamide administration. Data collected include: baseline characteristics, length of stay, doses of acetazolamide given, rate of intravenous sodium bicarbonate administration, initiation time of sodium bicarbonate, time urine pH ≥ 7, number of urine pH levels assessed, percentage of urine pH levels at goal, initiation time of methotrexate infusion, time of methotrexate clearance, amount of sodium bicarbonate administered, and grade of AKI. The primary endpoint will compare length of stay between cohorts. Secondary outcomes include comparison of: time from urine alkalinization to achievement of goal pH, time from goal pH to methotrexate infusion, achievement of urine pH goals, amount of sodium bicarbonate administered, and rate of AKI.

Study results will be utilized to implement changes in Avera McKennan inpatient oncology practice to improve patient outcomes with administration of high-dose methotrexate.

Learning Objective:
Discuss the efficacy of four urinary alkalinization practices associated with administration of high-dose methotrexate.
DIRECT ORAL ANTICOAGULANT USE IN PATIENTS WITH A HISTORY OF BARIATRIC SURGERY  

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As the rate of obesity continues to rise, the number of patients electing to undergo bariatric surgery is expected to increase proportionately. Patients who undergo bariatric surgery have significant physiological changes in their gastrointestinal tract that have the potential to impact drug absorption and kinetics. Theoretical changes include alterations in gastric pH, intestinal surface area, intestinal transporters and enzymes, and enterohepatic recirculation. This is especially important for drugs that have a narrow therapeutic window as small changes in absorption can have major safety and efficacy implications. One such class of medications is the direct oral anticoagulants (DOACs). Drugs in this class include apixaban, edoxaban, rivaroxaban, and dabigatran.

The current IRB approved study will be a retrospective chart review of patients with a history of bariatric surgery (BPD, SG, or RYGB) and were prescribed a DOAC (apixaban, edoxaban, rivaroxaban, or dabigatran) either for the prophylaxis or treatment of VTE or for stroke prevention in atrial fibrillation. Patients included are ≥ 18 years of age and have a primary care provider within the Fairview healthcare system.

The primary objective of this study will be to characterize efficacy and safety outcomes in patients receiving DOACs who have a history of bariatric surgery. Rates of either bleeding or clotting events will be collected and compared against historical values of DOAC use in the general population. Results obtained from this study may facilitate future studies of the individual DOACs and help direct clinical decision making in post-bariatric surgery patients who are prescribed anticoagulants.

COMPARISON OF LEVOTHYROXINE DOSING IN PATIENTS WITH AND WITHOUT HEART FAILURE  

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Evidence has shown that hypothyroidism may lead to worse prognosis in heart failure (HF) patients. Current recommendations from the American Thyroid Association suggest to initiate levothyroxine at lower doses (25 – 50 µg) and titrate more slowly in patients with cardiovascular diseases. However, no data currently exists for levothyroxine dosing specifically for HF patients.

The purpose of this study was to compare levothyroxine doses in patients with and without HF. Primary endpoint of average levothyroxine dose was analyzed using multivariable linear regression with clinically meaningful and available variables determined a priori. Secondary endpoints included average ejection fraction in HF patients with elevated thyroid stimulating hormone (TSH) compared to normal TSH, percentage of patients with elevated TSH in the HF population compared to patients without HF, and average dose of levothyroxine in patients with normal TSH.

A single center, retrospective cohort study was performed. Three hundred patients were included in the study with 100 patients in each arm (patients with no HF, patients with HF with reduced ejection fraction (HFrEF), and patients with other types of HF). Average levothyroxine doses (mcg/kg) were 1.5, 1.6, and 1.6 for no HF, HFrEF, and other types of HF, respectively (p=0.61). Factors found to be significantly related to levothyroxine dosing included gender, drug-drug interactions, and the time from documented levothyroxine and the TSH level.

While both HFrEF and the other types of HF had numerically higher levothyroxine doses in the linear regression, the increase was not statistically significant.

Learning Objective:
Summarize pathophysiology of thyroid hormone and heart failure
EVALUATION OF LIPOSOMAL BUPIVACAINE USE FOR POSTOPERATIVE PAIN IN BREAST SURGERIES AT A LARGE COMMUNITY HOSPITAL  Leah Yost, Megan Baumann, Amanda Gronniger, Sara Mills, Janice Schoeneck, Mosaic Life Care, 5325 Faraon Street St. Joseph, MO 64506. Leah.Yost@mymic.com.

Liposomal bupivacaine is currently FDA approved for postsurgical analgesia by injection into surgical site and use is thought to potentially help improve pain control, reduce opioid use, and improve patient quality of life postoperatively. Historically, data for effective use was shown in only bunionectomy and hemorrhoidectomy surgeries and current evidence of using liposomal bupivacaine for postoperative analgesia in patients who undergo surgery involving the breasts is limited. Due to this lack of information, the direct effect on post-operative pain relief in this patient population is unknown. Liposomal bupivacaine is associated with higher cost of care, so it is necessary to determine if the increased cost is justified with controlled pain post-operatively compared to the standard of care.

The objectives of this study are to evaluate pain control, opioid use, and rate of respiratory depression in patients who receive liposomal bupivacaine for breast surgeries compared to patients receiving other therapies.

These objectives will be assessed through a retrospective chart review of patients who received liposomal bupivacaine during a breast procedure from July 1, 2016 to June 30, 2017. The primary outcome measures will include pain scores and total morphine equivalents used at post-operative days 0,1,2 and average for total hospital length of stay. Statistical analysis will be performed on the data to compare groups.

The results of the study will be used to guide use of liposomal bupivacaine and ensure our patient’s post-operative pain control is successful and justified with the use and increased cost of liposomal bupivacaine.

Learning Objective:
Identify the potential benefit of liposomal bupivacaine for post-operative analgesia in patients who undergo breast surgeries and recognize the increased cost associated with treatment of liposomal bupivacaine.

RETROSPECTIVE COMPARISON OF ALLOMETRIC DOSING VERSUS TRADITIONAL DOSING FOR VANCOMYCIN  Nicholas Young, Brianna Jansma, Joey Strain, Katie Hayes, John Kappes, Thaddaus Hellwig, Beth Loecker, Regional Health Rapid City Hospital, 353 Fairmont Blvd, Rapid City, SD 57701. nyoung2@regionalhealth.org

The most appropriate approach to vancomycin dosing is a topic of debate. Literature shows vancomycin trough levels do not reliably correlate with obtaining an area under the concentration-time curve to minimum inhibitory concentration (AUC/MIC) ratio ≥ 400, the guideline-recommended target for optimal clinical efficacy. Another recently developed method for the dosing of vancomycin utilizes allometric dosing. This approach is based on the principle of the relationship between body size and physiology. Application of allometry may optimize vancomycin dosing, particularly in the obese population.

The purpose of this retrospective study is to evaluate the correlation between vancomycin trough levels using traditional dosing methods and the allometric dosing method. The secondary purpose is to assess the incidence of acute kidney injury, hospital readmission within 30 days of discharge, and 30-day mortality.

The objectives are assessed by utilization of a retrospective, electronic medical record chart review of patients with a positive methicillin-resistant staphylococcus aureus (MRSA) culture treated with vancomycin. Adult patients admitted to Regional Health Rapid City Hospital and Sanford USD Medical Center between January of 2015 and August of 2017 were reviewed for inclusion.

These results will be used to assist in the guidance of care for patients at Regional Health Rapid City Hospital and Sanford USD Medical Center. The ability to better predict the pharmacokinetics for the dosing of vancomycin will contribute to improved patient care and therapy management.

Learning Objective:
Discuss the correlation between vancomycin trough levels using traditional dosing methods and the allometric dosing method.
Neoadjuvant chemotherapy is indicated for locally advanced breast cancer patients. Pharmacogenomic testing is an additional tool to guide treatment. An ambulatory cancer center has provided precision oncology consult service for breast cancer patients since 2014. The objective of this study is to indicate whether patients received pharmacogenomic test achieved a better therapeutic outcome or not.

This is a retrospective cohort study. Patient profiles were reviewed to include breast cancer patients who received pharmacogenomic testing in the neoadjuvant setting from June 2014 until January 2017. Control group are comparable patients received standard neoadjuvant therapy without pharmacogenomics testing. The exclusion criteria are HER-2 positive, male, pregnant, received radiation therapy prior to surgery, stage 0-I, and metastatic disease. Primary outcome is the immediate response per surgical pathology report. Secondary outcomes are disease-free survival (DFS) and tolerability. DFS is counted from surgery day until the last follow-up day confirmed disease-free. Tolerability is evaluated by the number of patients who required dose reduction, treatment delay, supportive care, hospitalization during neoadjuvant therapy, or experienced grade 3 or 4 adverse events per NCI CTCAE v4.03. Data collected including age at diagnosis, initial clinical and TNM stage, tumor histologic type, ER/PR status, HER-2 status, Ki-67, tumor grade, pharmacogenomic testing results, surgery received as well as treatment outcomes and tolerability mentioned above.

The outcome of this study will be used to improve pharmacogenomically driven therapy in the neoadjuvant setting for breast cancer. These results could potentially guide therapy by identifying efficacy of current practices and opportunities for improvement.

Learning Objective:
Identify risk factors for poorer outcomes of neoadjuvant therapy in the breast cancer patient population.

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Four factor prothrombin complex concentrates (4F-PCC) was approved in Europe before obtaining FDA approval. Thus, numerous studies in other countries outside of the U.S. demonstrated similar clinical outcomes between fixed lower doses of 4F-PCC compared to variable weight-based dosing found in the package insert in both intracranial hemorrhage (ICH) and non-ICH patients.

The objective of this study is to evaluate the clinical efficacy and cost savings of an evidence based change to lower fixed dose 4F-PCC regimen versus the previous variable dosing regimen in reversing warfarin in intracranial and spinal hemorrhage, life-threatening/severe hemorrhage, and urgent surgery/intervention.

This study will use retrospective data analysis of patients who receive 4F-PCC from November 1, 2013 until March 1, 2018. The primary endpoint of this study is post 4-factor prothrombin complex concentrates reversal INR of less than 2.0 and less than 1.5 in intracranial bleeds. Secondary endpoints include time to INR reversal, clinical reversal success, requirement of second dose, bleeding complications, thrombotic complications, other adverse effects, and cost. Clinical success of reversal of bleeding will be determined by the attending physician.

If the revised dosing regimen shows similar outcomes to the current dosing regimen, the revised protocol will be retained at the institution and possibly extended to other institutions in the health system. If these outcomes are not achieved, then the institution will revert to the original dosing protocol.

Learning Objective:
Discuss the impact of the implementation of a lower fixed-dose 4-factor prothrombin complex concentrate (4F-PCC) protocol on clinical outcomes and cost effectiveness.
IMPLEMENTING A STANDARDIZED TRAINING PROGRAM FOR COMPOUNDING STERILE PREPARATIONS TO IMPROVE OVERALL COMPLIANCE WITH USP 797 STANDARDS

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The IV room is the area where the vast majority of compounded sterile preparations are made for patients at my institution. The processes that occur in compounding sterile preparations are dictated by United States Pharmacopeia (USP) Chapter 797, a set of standards that are enforceable by state and federal agencies, including the Minnesota Board of Pharmacy and accrediting organizations such as the Joint Commission. Given the extensive regulatory requirements for compounding sterile preparations, as well as the vast amount of documentation requirements, it is critical to have effective processes in place to train our pharmacy staff to meet USP 797 standards and document accordingly, as tracked in Simplifi 797® at our institution. There is opportunity to improve compliance and adherence to USP 797 standards when compounding sterile preparations in the sterile processing area by updating and standardizing our existing IV room training program at my institutions’ inpatient pharmacy. Current workflow processes will be analyzed to identify opportunities for improvement in order to enhance adherence to USP 797 standards in the IV room. Additionally, as part of a revamped sterile processing training program, a new Learning Management System (LMS) module, with quiz, specifically for IV room staff, will be created to improve understanding of USP 797 requirements. The outcomes of the revamped training program will be discussed in relation to the environment in which sterile products are compounded at this institution.

Learning Objective:
Identify the critical components of a training program aimed at improving technician understanding and adherence to USP 797 standards during daily workflow in the IV room.

AN EVALUATION OF CANDIDACY FOR DIRECT ORAL ANTICOAGULANTS IN PATIENTS POORLY CONTROLLED ON WARFARIN

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Past research shows that warfarin patients who remain outside of their International Normalized Ratio (INR) goal range have increased risk for thromboembolic and/or adverse events. The quality of a patient’s anticoagulation with warfarin can be assessed by calculating Time in Therapeutic range (TTR), the amount of time a patient is within their goal INR range. Low TTR is associated with increased rates of adverse events. The National Institute for Health and Care Excellence (NICE) released guidelines in 2014 on the management of atrial fibrillation in which they recommend all patients with poor INR control on warfarin, defined as TTR less than 65%, have their anticoagulation management reassessed. Previous studies have demonstrated that Direct Oral Anticoagulants (DOAC) have similar or superior efficacy to reduce the risk of strokes or embolisms for patients with Nonvalvular Atrial Fibrillation (NVAF) compared to warfarin.

The purpose of this study is to determine candidacy for DOAC therapy among patients on warfarin for NVAF who have low TTR. Patients with a TTR less than 60% in 2017 will be reviewed for contraindications to DOAC therapy based on renal function, weight, past medical history, and medication interactions. Patients that meet criteria for DOAC therapy will be referred to providers for anticoagulation reassessment. The primary endpoint is the percentage of patients found to be a candidate for DOAC therapy, and the secondary endpoint is outcome of referral.

The results of this study will be used to demonstrate clinical quality improvement in patient care in the anticoagulation clinic.

Learning Objectives:
Identify the most common clinical indicators that exclude patients from eligibility or clinical benefit from DOAC therapy
Recall the percentage of poorly controlled warfarin patients that are referred for switch in therapy to a DOAC in the setting of NVAF
Meningitis and encephalitis (ME) are severe neurologic infections that may lead to poor neurological outcomes or death if not treated promptly and appropriately. Due to infection severity and the overlap of clinical and laboratory characteristics of bacterial and viral infections, empiric antimicrobial therapy is often prolonged pending microbiology lab results. Rapid and accurate tests have the potential to impact the management of ME by decreasing the time to appropriate therapy.

The objective of this study is to determine the impact that ME polymerase chain reaction (PCR) test panel utilization has on antimicrobial management and clinical outcomes. Time to optimization of antimicrobial therapy, length of hospital stay, length of antimicrobial therapy, total cost, and in-hospital mortality will be compared between groups.

These objectives will be assessed by analyzing data before and after the implementation of ME PCR panel testing at our institution. Adult patients, within the defined study period, presenting to Saint Luke's Hospital with suspected community acquired ME will be included in this study. The study group includes patients admitted from March 2017 to February 2018 that received antimicrobial therapy with guidance from ME PCR panel. A control group consists of patients admitted between March 2016 and February 2017 that received antimicrobial therapy without ME PCR panel guidance.

The results of this study are anticipated to favor the use of the ME PCR test panel by decreasing length of antimicrobial use. This study may impact the implementation of the ME PCR test panel across the Saint Luke's Health System.

Learning Objective:
Describe the purpose of using a rapid diagnostic PCR test to guide the treatment of meningitis and encephalitis