The Impact of Optimized Patient Education Material

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UAN: 0048-0000-18-079-L04-P

Learning Objectives:

1. Describe opportunities for optimizing patient educational materials.
2. Discuss the benefits of optimizing patient educational material.

Purpose:
The purpose of this study is to assess patient satisfaction on current educational material at Detroit Medical Center (DMC) and evaluate the impact on patient satisfaction of new supplemental patient education. Literature has shown that patient’s attention, recall and comprehension of health related information increased when illustrations accompanied verbal or text-based explanations. Currently at DMC patient education is provided through inpatient videos and discharge printed material. There are optimization opportunities via consolidation of material, adding illustrations, improving patient readability, and providing patients with discharge medication lists.

Methods:
This is a prospective, quality improvement pilot study. Following Institutional Review Board approval, patients (N=90) will be screened for eligibility during inpatient admission to DMC Harper University Hospital. Eligibility criteria include English speaking patients between the ages of 18 to 89 years old with heart failure. Patients will be excluded if they are unable to provide consent or have cognitive deficit. Baseline data to be collected include: age, sex, number of emergency department visits and hospitalizations within past 6 months, number of medications at discharge, race, health literacy levels, chronic conditions, and previous educational materials distributed. Once informed consent is obtained, patients will be evaluated for their health literacy levels via a validated health literacy and complete the satisfaction survey on previously received patient education. Patients will be provided with updated educational material prior to discharge. Two weeks post discharge, patients will be contacted for the follow-up satisfaction survey. Finally, we will evaluate the readmission trend, by prospectively comparing estimated readmission risk scores with actual readmission scores. Data will be collected from patient’s electronic medical records and patients will be grouped based on their scores.

Results: N/A (Research is in-progress)

Conclusions: N/A
Identifying risk factors for systemic infections in pediatric malignancies

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Learning Objectives:

1. Explain the impact of febrile neutropenia on morbidity and mortality
2. Describe the current recommendations on prophylaxis of febrile neutropenia for pediatric malignancies

Purpose:
Systemic infection is one of the leading causes of mortality in pediatric patients undergoing chemotherapy. Current guidelines recommend prophylactic anti-infectives for patients with acute myeloid leukemia (AML), hematopoietic stem cell transplant (HSCT), or anticipated neutropenia for greater than 7 days. The objective of this study is to identify characteristics of children with other types of cancer who develop systemic infection and may also benefit from anti-infective prophylaxis.

Methods:
This retrospective case-control study has been approved by the Institutional Review Board. The electronic medical record system will identify patients who have been treated with chemotherapy since January 2015 at the Children’s Hospital of Michigan. Patients diagnosed with AML, relapsed acute lymphoblastic leukemia or with a history of HSCT are excluded. Case patients are those admitted for fever and hospitalized with intravenous antibiotic treatment for longer than 72 hours. Patients in the control group will be all others who were treated for cancer and were not excluded or classified as cases. The following data will be collected for all patients: age, gender, race, weight, zip code, cancer type, chemotherapy protocol, type of central venous access, and absolute neutrophil count nadir and platelet count closest to two weeks after chemotherapy administration. Data for cases will be collected from the time of first hospital admission meeting case definition and will additionally include chemotherapy phase, culture results, rapid viral panel results, and absolute neutrophil count and platelet count at admission. Data for controls will be collected following the most recent chemotherapy administration. A univariate analysis will be used to test for significance, variables with a P value of

Results: Data collection and analysis are currently being conducted; results and conclusions will be presented at the 2018 Ohio Pharmacy Resident Conference

Conclusions: We hypothesize that there may be a correlation between different patient characteristics and laboratory markers that can help identify patients who are at higher risk of developing systemic infection during chemotherapy. This can be used to potentially prevent these infections through prophylaxis.
Pharmacy directed implementation of a non-opioid order panel at a community hospital emergency department

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Learning Objectives:

1. Discuss the treatment of pain using multimodal analgesic strategies
2. Describe the use of a non-opioid order panel to manage pain in the emergency department

Purpose:
In light of the national opioid epidemic and regional heroin crises, the maximization of non-opioid alternatives to pain management in the emergency department is imperative. The primary objective of this study is to reduce opioid utilization for the treatment of pain at St. Rita’s Medical Center from December 2017 to February 2018 when compared to December 2016 through February 2017. The secondary objectives are the reduction of the overall number of opioid prescriptions written at discharge from the emergency department and reduction of opioid use per pain modality.

Methods:
This study was approved by the Institutional Review Board. An order panel that contains several non-opioid analgesic modalities for renal colic, musculoskeletal pain, and headache/migraine associated pain was created. Prior to order panel implementation, emergency medicine staff will be educated on appropriate patient selection and utilization of the non-opioid panels. The 10th revision of the International Statistical Classification of Diseases and Related Health Problems will be utilized to identify all patients presenting to and released from the emergency department that received an opioid. These patients will be stratified into three pain groups, renal colic, musculoskeletal pain, and headache. The opioid used will be assessed to determine volume. Opioid prescriptions written at discharge from the emergency department will also be collected and analyzed accordingly. All patient data will be de-identified. Data collection post order set implementation will begin December 2017 and end February 2018. Data prior to order set implementation from December 2016 through February 2017 will also be collected to provide a historic control. Data will be utilized to determine if a reduction in opioid utilization of 15 percent for all objectives was obtained.

Results: Data analysis is currently being conducted; results will be presented at the 2018 Ohio Pharmacy Resident Conference.

Conclusions: N/A (research in progress)
Assessing analgosedation: The effect of continuous infusion versus intermittent bolus fentanyl in mechanically ventilated patients

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Learning Objectives:

1. Define analgosedation and review current recommendations for managing pain and sedation in mechanically ventilated patients
2. Discuss possible opioid dosing strategies and the effect on patient outcomes

Purpose:
Analgosedation is the paradigm for intensive care unit (ICU) sedation management, involving early pain control to achieve a desired level of light sedation circumventing the need for additional sedatives. Intravenous opioids are first-line treatment for pain but can lead to adverse effects such as prolonged respiratory depression and gastrointestinal dysmotility. Given there is no consensus dosing strategy for opioids in mechanically ventilated patients, the objective of this study is to evaluate the effect of continuous infusion (CI) versus intermittent bolus (IB) fentanyl on mechanical ventilation duration as well as sedative dose requirement, pain management and ileus incidence.

Methods:
This IRB-approved retrospective cohort study evaluates the effect of CI versus IB fentanyl in mechanically ventilated patients. Patients 18 years or older, admitted to the ICU and mechanically ventilated for at least 24 hours who received CI or IB fentanyl between July 2016 and September 2017 were included. Patients with a tracheostomy, requiring deep sedation or receiving comfort care measures were excluded. Data collected includes: patient demographics, APACHE score, admitting diagnosis, admission to medical, cardiovascular or surgical ICU, history of home narcotic, illicit drug or alcohol use, administration of a stimulant laxative within 24 hours of fentanyl order, self-extubation or reintubation occurrences and history of prior lung disease. Endpoints collected include mechanical ventilation duration, CI sedative and fentanyl doses while intubated, ICU and hospital length of stay, pain and RASS scores, concomitant pain/sedative medications and ileus incidence.

Results: Categorical and continuous data will be analyzed using Chi-Square or Fischer’s Exact test and Student’s t-test or Rank sum analysis, respectively, as appropriate. Multivariate linear regression will be done to adjust for baseline covariates including age, APACHE score, prior lung disease and ICU unit. Results will be presented at the Ohio Pharmacy Resident Conference.

Conclusions: Conclusions will be presented at the Ohio Pharmacy Resident Conference.
Prevalence and predictors of butalbital use in adults for migraine treatment

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Learning Objectives:

1. Describe the risk associated with the prescribing of butalbital and butalbital containing products
2. Discuss the potential concerns of butalbital prescribing

Purpose:
Evidence butalbital worsens episodic migraine to chronic migraines and its abuse potential are known. In 2015, The American Headache Society (AHS) and the American Academy of Neurology released updated guidelines for the treatment of migraine. Due to the lack of established effectiveness in randomized controlled trials, butalbital was given a Level C recommendation based on the 2000 AHS/AAN guidelines. The 2016 AHS/AAN recommendations for management of migraines in emergency departments excluded butalbital as an abortive therapy. The objective of this study is to evaluate rates of butalbital use in patients treated for migraine and identify factors associated with butalbital use.

Methods:
This national cross-sectional study will use data from the National Ambulatory Medical Care Survey (NAMCS) and the National Hospital Ambulatory Medical Care Survey (NHAMCS). De-identified data was collected from these databases provided by the Centers for Disease Control. Each survey is represented in their own model and reflect data collected from 2010-2015. Patients include those who had a visit associated with migraine and are greater than 18 years of age. Those who were pregnant at the time of the survey were excluded. The incidence of butalbital prescribing will be analyzed using descriptive statistics. Additional information including patient and provider specific factors will be analyzed using multivariate logistic regression will be used to identify predictors associated with butalbital use including patient demographics (ie. age, sex, geographical location), patient specific factors (ie. Cardiovascular disease, opioid use, substance use disorder, concurrent abortive and/or chronic preventative therapy) and prescriber characteristics (ie. Physician or non-physician, neurologist or other specialty, and practice setting).

Results: Pending statistical analysis and will be presented at the conference.

Conclusions: Pending statistical analysis and will be presented at the conference.
Provider compliance with ISMP medication safety for direct oral anticoagulant therapy recommendations

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Learning Objectives:

2. Identify areas of improvement for BVHS outpatient providers in regards to DOAC prescribing.

Purpose:
To evaluate the level of compliance Blanchard Valley Health System (BVHS) outpatient providers have regarding the Institute for Safe Medical Practices (ISMP) antithrombotic therapy self-assessment guide.

Methods:
This study is a retrospective analysis of direct oral anticoagulants (DOACs) prescribed by primary care, cardiology or hematology/oncology providers from December 1, 2016 to December 31, 2017. Information was obtained using BVHS electronic medical records. Patients included in this were ages 18 or older and were prescribed apixaban, dabigatran, edoxaban, or rivaroxaban during the data collection time frame. Information obtained includes serum creatinine (Scr), complete blood count (CBC), height, weight, age, medication name, indication, and dose.

Results: A total of 189 patients were included in this study. The primary outcome of this study was the number of patient who had a Scr, and CBC obtained at baseline (81%), and the number of patients whose DOAC dose was appropriate per dosing recommendations (72%). Secondary outcome was the number of high risk patients who had a follow-up visit every 3-6 months (51%, p=0.003).

Conclusions: BVHS outpatient providers have fair compliance with obtained appropriate baseline data before starting a patient on a DOAC. However, BVHS outpatient providers have poor compliance with follow-up of high risk patients after DOAC initiation.
Comparison of argatroban and bivalirudin protocols for the treatment of heparin-induced thrombocytopenia

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UAN: 0048-0000-18-085-L01-P

Learning Objectives:

1. Review the current literature for the management of heparin-induced thrombocytopenia.
2. Discuss factors that increase the risk of developing heparin-induced thrombocytopenia.

Purpose:
Currently in the United States argatroban is the only anticoagulant that is FDA-approved for prophylaxis or treatment of thrombosis in patients with heparin-induced thrombocytopenia (HIT). The 2012 CHEST guidelines recommend argatroban over other nonheparin anticoagulants. However, there is an increasing amount of research in the use of bivalirudin for the treatment of HIT. ProMedica Toledo Hospital recently developed a bivalirudin protocol designed specifically for use in patients with HIT requiring anticoagulation. However, the data are lacking to provide a recommendation for one anticoagulant over the other. The purpose of this study was to determine the clinical impact of argatroban vs bivalirudin for the treatment of HIT. The primary objectives were to evaluate the time to therapeutic coagulation and the percentage of time achieving therapeutic coagulation. Secondary objectives included major and minor bleeding and the occurrence of new thromboembolic events.

Methods:
A single-center retrospective chart review was performed at a 794-bed, tertiary medical center evaluating patients who were treated with either argatroban or bivalirudin for HIT between November 2016, and November 2017. Patients were eligible if they were 18 years or older and received either bivalirudin or argatroban for greater than 24 hours. Patients were excluded if they had hepatic failure, known pregnancy, history of allergy to argatroban or bivalirudin, or received recombinant tissue plasminogen activator (alteplase) during this admission. Data were collected via electronic medical records and included: demographic information, baseline and serial aPTTs, PT/INR, platelets, anticoagulation indication, duration of therapy, cost of each agent, serum creatinine, Child-Pugh Class, time to achieve goal aPTT, percentage of time achieving therapeutic aPTT, number of dose changes, date of previous and new thromboembolic events, bleeding academic research consortium (BARC) criteria, and disposition at discharge.

Results: Data analysis is ongoing.

Conclusions: To be presented at the 2018 Ohio Pharmacy Residency Conference.
**Implementation of a rapid blood culture identification system in a large rural medical center and impact on patient care outcomes**

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**Learning Objectives:**

1. Describe the benefits of rapid blood culture identification
2. Explain the actions taken when a positive blood culture is identified at Saint Rita’s Medical Center
3. Discuss supportive materials used to assist pharmacists with antimicrobial recommendations
4. Evaluate impact of rapid blood culture identification implementation on patient care outcomes

**Purpose:**
Rapid blood culture identification systems have known positive benefits for patient care, antimicrobial stewardship, and cost containment. Due to the increased mortality rate in patients with bacteremia, it is critically important to rapidly identify and treat these infections. The purpose of this study is to oversee successful implementation of such a system and evaluate changes in measurable patient care related outcomes subsequent to implementation. The primary outcome is to determine if pharmacist intervention combined with a rapid blood culture identification system results in decreased time to de-escalation of antibiotics.

**Methods:**
This institutional review board approved study began with creating a process to facilitate around the clock communication between the laboratory and providers, using the pharmacy department as an active participant and antimicrobial steward. A response algorithm to each of the 27 targets identified by the rapid polymerase chain reaction test has been created as a clinical decision tool for antimicrobial recommendations. A preliminary trial run was conducted to evaluate laboratory performance and the communication process. While this occurred, extensive education was provided for pharmacists and providers regarding the merits of the process and steps for implementation. After the blood culture identification system was fully implemented, de-identified data was collected on all positive blood cultures, excluding certain patient populations. Demographic data was obtained to ensure the population does not differ from a reference population of individuals with positive blood cultures resulted from the same time span in the previous calendar year. Patient outcome data collected includes time to coverage of pathogen, time to de-escalation of antibiotics, duration of therapy, success rate of pharmacist intervention, pathogen identified by rapid identification system, incidence of rapid identification system culture mismatch, gram stain result, duration of stay (total and ICU), and mortality.

**Results:** Data analysis is currently being conducted and will not be finalized by the required abstract submission date; results will be presented at the 2018 Ohio Pharmacy Resident Conference.

**Conclusions:** N/A (research in progress)
Bacteremia in hospitalized patients receiving intermittent-hemodialysis: A surveillance report of common risk factors

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Learning Objectives:

1. Describe common risk factors associated with the development of bacteremia in patients receiving intermittent hemodialysis
2. Identify most common causative bacterial isolates responsible for bacteremia in patients receiving intermittent hemodialysis

Purpose:

Patients with end-stage renal disease (ESRD) receiving hemodialysis are at increased risk of infection, particularly bloodstream infection (BSI), due to the presence of vascular devices. Infection rates are as high as 35% within the first 3 months of central venous catheters (CVC) placement. Most BSI are caused by gram-positive organisms (87%), but gram-negative infections are not uncommon (12.5%) and isolation of multi-drug resistant organisms (MDROs) is a growing concern. The purpose of this study is to identify patient risk factors and the most common organisms causing bacteremia in patients receiving hemodialysis hospitalized at our institution could help clinicians prescribe directed empiric therapy and improve patient outcomes while decreasing antimicrobial resistance.

Methods:

IRB-approved retrospective study examining all inpatients at the University of Toledo Medical Center (UTMC) with ESRD receiving hemodialysis and at least one positive uncontaminated blood culture between January 1, 2012 and June 30, 2017. Patients were included if they had at least a 3-month history of intermittent hemodialysis (IHD). Patients were excluded if they were immunocompromised or under the care of hospice. The primary objective was to determine the prevalence of pathogens responsible for bacteremia in hospitalized patients receiving hemodialysis at UTMC. The secondary objective was to identify risk factors associated with the isolation of MDROs in this patient population.

Results: A total of 821 patient encounters were screened resulting in the inclusion of 58 patient encounters (47 unique patients). Median age was 68.1 (IQR 57.9-73.6) with a median hospital stay of 8.8 days (IQR 5.85-11.8). Gram-positive isolates accounted for 77.5% of infections. MDROs were isolated in 50% of cultures. Numerically the risk factors most associated with MDRO bacteremia include empiric antimicrobial use within previous 90 days, history of MDRO within previous 90 days, and antibiotics with ESBL+ coverage within previous 90 days.

Conclusions: Gram-positive organisms are the most prevalent cause of bacteremia in hospitalized hemodialysis patients. These patients are also more susceptible to MDRO related infections. Appropriate empiric therapy should be administered. Risk factors to consider for MDRO bacteremia include history of antibiotic use as well as history of MDRO infection.
Evaluation of fresh frozen plasma (FFP) use in angiotensin-converting enzyme inhibitor (ACEI)-induced angioedema

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Learning Objectives:

1. Describe the pathophysiology of ACEI-induced angioedema
2. Review the current literature on potential treatment options for ACEI-induced angioedema

Purpose:
ACEI-induced angioedema results from an excess of bradykinin. In the renin-angiotensin-aldosterone system (RAAS), renin aides in the conversion of angiotensinogen to angiotensin I. The angiotensin-converting enzyme (ACE) then converts angiotensin I to angiotensin II and bradykinin to bradykinin metabolites. Therefore, ACEIs reduce the metabolism of bradykinin and result in its accumulation, ultimately leading to vasodilation, increased vascular permeability, and angioedema. Angioedema is a rare but life-threatening adverse reaction of ACEIs. Current available agents for the treatment of ACEI-induced angioedema are used off-label and come with the significant barriers of cost and availability. Another available and less expensive treatment option is FFP. FFP contains kininase II, an enzyme that mimics the activity of ACE, and breaks down bradykinin. However, the use of FFP for this indication is only supported by case reports and case series. The purpose of this study is to add to the current available literature in support of the use of FFP in ACEI-induced angioedema.

Methods:
This study is a retrospective, single-center, cohort review comparing patients who received FFP for ACEI-induced angioedema versus those who did not. This study was approved by the local Institutional Review Board (IRB). Patients were included if they were seen in a ProMedica Emergency Department between November 2016 and December 2017 and were at least 18 years of age with a diagnosis of ACEI-induced angioedema. Patients were excluded if they were less than 18 years of age or if they received FFP for any other reason other than ACEI-induced angioedema. The primary outcome is to evaluate the incidence and duration of intubation and ICU length of stay in patients who either received or did not receive FFP for ACEI-induced angioedema. The secondary outcome is to assess the difference of healthcare costs with early administration of FFP by preventing the need for intubation and ICU admission.

Results: Data is currently being analyzed. Final results and conclusions will be presented at the Ohio Pharmacy Resident Conference.

Conclusions: Data is currently being analyzed. Final results and conclusions will be presented at the Ohio Pharmacy Resident Conference.
Evaluation of Pharmacists’ and Pharmacy Interns’ Knowledge and Comfort with Dispensing Naloxone without a Prescription in a Community Pharmacy

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Learning Objectives:

1. Explain the use and importance of naloxone in the opioid-related overdose death epidemic
2. Describe pharmacists’ and pharmacy interns’ knowledge and comfort with dispensing naloxone with a prescription

Purpose:
The purpose of this study is to evaluate pharmacists’ and interns’ knowledge of naloxone and to assess their comfort level with dispensing naloxone without a prescription.

Methods:
This is a prospective study with a pre/post survey design and education intervention. Participants include pharmacists and interns registered with the Ohio Board of Pharmacy and employed by two divisions within a grocery-store based community pharmacy enterprise. The pre-survey was distributed via email and administered through an online survey platform. It evaluated therapeutic naloxone knowledge using the Opioid Overdose Knowledge Scale (OOKS), a validated survey tool, and assessed comfort using Likert-style questions developed by the research team. Gaps identified from the pre-survey will guide creation of a voluntary education intervention. The intervention includes a naloxone review and various pharmacist-patient scenarios to address comfort. It will be distributed via email and viewed using an online video platform. A post-survey, with similar content as the pre-survey, will follow the intervention to assess changes in knowledge and comfort. Descriptive and inferential statistics will be used as appropriate with an alpha value of 0.05.

Results: Based on 203 responses (19.7% response rate) gathered from the pre-intervention survey, the mean score OOKS score was 33.26 (7.18, 35[7.44]); the higher the score, the more knowledgeable (maximum points = 47). Gaps in naloxone administration were identified. Pharmacists and interns felt least comfortable with dispensing naloxone to patients with an opioid prescription and a history of renal or hepatic dysfunction, and felt most comfortable with dispensing to patients with a history of opioid overdose.

Conclusions: Interns were more knowledgeable about naloxone than pharmacists. Additionally, pharmacists and interns need more training on dispensing naloxone to patients with an opioid prescription and a chronic disease (e.g., renal or hepatic dysfunction) to feel more comfortable with dispensing. This will be addressed in the education intervention.
Readmission rate reduction for Medicare Advantage patients of a physician-owned medical group utilizing an interdisciplinary transitions of care program

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Learning Objectives:

1. Evaluate the impact of an interdisciplinary post-acute transitions of care program on acute health care utilization within 30 days after discharge
2. Identify medication-related interventions made by a pharmacist involved in a post-acute transitions of care program

Purpose:
The Value-Based Payment Model, established by Centers for Medicare and Medicaid Services (CMS), provides differential payment to an Accountable Care Organization (ACO) based upon certain measures, including 30-day hospital readmissions. Central Ohio Primary Care (COPC), an ACO-like physician-owned medical group, implemented an interdisciplinary program, including nurse care coordinators and pharmacists, for high risk patients to enhance their care and reduce readmission rates. This study’s purpose is to evaluate the impact of an interdisciplinary post-acute transitions of care (TOC) program on acute healthcare utilization by comparing readmissions pre- and post-implementation of this program.

Methods:
Encounters were included 12 months pre- and post-implementation of the TOC program. Patients with Medicare Advantage were included if they were admitted to a COPC hospitalist service. Patients qualified for the interdisciplinary TOC program if they had a diagnosis of heart failure, diabetes with complications, or chronic obstructive pulmonary disease. The primary outcome was acute healthcare utilization within 30 days after discharge. The cohort of those in the post-implementation TOC program was matched to pre-implementation patients to further explore the impact on 30-day readmissions rates. The identification of medication-related problems by a pharmacist was reported for those enrolled within the program.

Results: Overall, 6364 encounters were included with 328 readmissions in the pre-implementation group (n = 2781) and 458 readmissions in the post-implementation group (n = 3583) (11.8% vs 12.8%, p > 0.05). From each group, 264 encounters were included in the matched cohort. Preliminary results reveal readmission rates in patients with a general medicine chief complaint were improved (29.5% pre-implementation vs 15.5% post-implementation, p < 0.001). The most common pharmacist intervention in the TOC program was the recommendation to initiate a medication (26.5%, n = 338).

Conclusions: The preliminary results suggest that an interdisciplinary post-acute TOC program may reduce 30-day readmission rates for certain patient populations.
Assessing Utilization of Pharmacy Services in an Underserved Population

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Learning Objectives:

1. Define characteristics of the patient population that receives care at a charitable pharmacy
2. Identify ways to improve outreach to patients who need pharmacy services at a charitable pharmacy

Purpose:
The purpose of this study is to better understand the patient population that currently accesses services provided by a charitable pharmacy and use this data to determine how to continually ensure that patients who need care are being reached. Specific aims include describing patient referral information, identifying the mode of transportation used to visit the pharmacy, understanding what caused patients to establish care, and analyzing the use of primary care. Evaluation of patients’ perceived ability to afford care and use of alternative care options when unable to afford care will serve as secondary objectives.

Methods:
This descriptive study consists of conducting interviews of patients currently filling medications at the Charitable Pharmacy of Central Ohio (CPCO). The interview consists of a survey which is comprised of questions created by the research team and includes pertinent demographic data such as age group, gender, ethnicity, employment status, and insurance status. The inclusion criteria are being greater than 18 years of age and speaking English as the patient’s primary language. Patient recruitment occurs while patients are waiting to fill prescriptions at the pharmacy, and information collected will be entered in a secure web application designed to build and manage online surveys. Descriptive statistics will be used to report trends in patient characteristics.

Results: Research currently in progress. Preliminary results will be presented at the Ohio Pharmacy Residency Conference.

Conclusions: The results of this study will be utilized to better understand the current patient population seeking care at a charitable pharmacy and to inform expansion of services and future outreach efforts. Communities who care for underserved patients across the country can use this data as a starting point to help compare patient populations and characteristics to identify areas of need and generate ideas for targeted efforts that could improve access to medications and pharmacy services for vulnerable patients.
Effectiveness of Deprescribing Proton Pump Inhibitors Following Inappropriate Use in Adults

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Learning Objectives:

1. Determine appropriateness of PPI usage in patients admitted taking PPI prior to admission
2. Influence effective PPI deprescribing in patients taking PPI’s inappropriately
3. Identify the effectiveness and safety of PPI deprescribing
4. Evaluate patient perception of a deprescribing program

Purpose:
Proton pump inhibitors (PPIs) have consistently made top ten lists for the most prescribed medications within the past 5 years. We know that in many institutions, a significant portion of patients admitted are placed on a PPI with up to 70% of patients having no indication for its use. These PPIs are frequently continued into the outpatient setting for durations much longer than evidence-based literature recommends. These factors contribute to the trend of overprescribing and put patients at risk for potentially serious side effects, such as Clostridium difficile infections and bone fractures. Deprescribing efforts have been made in an attempt to discontinue PPI therapy in patients taking PPI’s inappropriately long term, but the most effective method has yet to be established.

Methods:
This primary outcome of this study will be the effectiveness of a deprescribing program for proton pump inhibitors within Grandview Medical Center upon hospital admission to the teaching service. This will be done via a prospective identification of study candidates using PPI’s inappropriately, informed consent, and deprescribing program intervention followed by a 14 day follow-up.

Results: The study is still ongoing.

Conclusions: The study is still ongoing.
Evaluating the impact screening for hepatitis C through a pharmacist-led mobile clinic has on screening rates in a rural, underserved population

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UAN: 0048-0000-18-094-L01-P

Learning Objectives:
1. Recognize the lack of availability of Hepatitis C screening in Hardin county.
2. Identify risk factors for Hepatitis C infection.
3. Describe the pharmacist’s role in screening for Hepatitis C

Purpose:
According to Centers for Disease Control, hepatitis C (HCV) in Ohio increased by 1000 percent from 2011 to 2015. Recently updated guidelines recommend HCV screening to include 1945-1965 birth dates, injection/illicit drug users (IDU), long-term hemodialysis, percutaneous/parenteral exposures, and children born to HCV-infected women. Hardin County ranks among the top ten counties for IDUs in Ohio. HCV testing is only available at the county Health Department on limited days and times. The purpose of this project is to offer HCV screenings to underserved patients through a pharmacist-led mobile clinic and to connect positive-test patients to appropriate care.

Methods:
This study is IRB approved and will be conducted through the rural mobile health clinic. Prior to being screened, patients will complete a survey to collect demographic information, past medical history, assess risk factors, and determine what, if any, barriers prevented previous screening. Patients will be screened using the OraQuick HCV test according to an approved protocol. Test results will be interpreted by a pharmacist, or a pharmacy student supervised by a pharmacist, and explained to the patient. Patients that test positive will be educated on the disease state and referred to their primary care physician (PCP). Patients without a PCP will be referred to the local federally qualified health center (FQHC). Patients referred for treatment will be followed up with by phone to confirm that they are seen by an appropriate health care provider for hepatitis C genotype and treatment. The primary outcome will be number of patients screened. Secondary outcomes include assessment of barriers preventing patients from being screened, patient risk factors, and number of patients referred.

Results: Results to be presented at OPRC.

Conclusions: Conclusions to be presented at OPRC.
Analyzing the financial impact of pharmacy-driven medication reconciliation in a large community hospital.

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UAN: 0048-0000-18-095-L04-P

Learning Objectives:

1. Review the importance of accurate medication history and reconciliation for preventing adverse drug events.
2. Discuss the most common types of medication errors and the potential cost impact of pharmacy-driven medication reconciliation processes.

Purpose:
Medication reconciliation is an important tool used to decrease adverse drug events (ADEs) during transitions of care. Despite best efforts, accurate prior to admission medication lists can be difficult to obtain. This study evaluated the current admission medication reconciliation procedure at a large community hospital and analyzed the potential financial impact of pharmacy-driven medication reconciliation. The primary endpoint of the study was cost impact. Secondary endpoints included number and type of discrepancies identified, length of stay, and 30-day readmission rate.

Methods:
The electronic medical record was utilized from September 1 to November 30, 2017 to identify patients over 18 years of age admitted to one transitional care unit in the preceding 24 hours, had more than five prior to admission medications, and a medication history completed during the current admission. A second medication history and reconciliation were completed by a pharmacy resident, staff pharmacist or student pharmacist to identify discrepancies between the obtained and active medication histories. Discrepancies that lead to incorrect reordering of medications and required pharmacist intervention to avoid a potential ADE were used to determine the potential cost avoidance utilizing the Society of Hospital Medicine average hospital stay cost per ADE of $4,655.

Results: Based on the average discrepancies per patient, patients admitted to the unit annually, and the rate of discrepancies needing intervention in the study, annual cost avoidance was found to be $1,179,763. Utilizing the average time per medication reconciliation during the study (18 minutes), it was determined that the net cost impact of pharmacist-lead medication reconciliation for this unit would account for $1,139,263 annual cost savings.

Conclusions: Based on this study, it is clear that pharmacy-driven medication reconciliation can have a profound impact on ADE costs in this large community hospital.
Evaluation of Burn Resuscitation Protocol in Severe Burn Patients

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UAN:0048-0000-18-096-L01-P

Learning Objectives:

1. Discuss fluid resuscitation strategies in the setting of severe burn
2. Explain adjunctive therapies to fluid resuscitation in the setting of severe burn

Purpose:
Determine the adherence to existing protocols for the management of severe burn patients within our medical institution. Analysis will also examine the impact of vitamin C and albumin on patient outcomes.

Methods:
Patients will be identified by searching a trauma burn registry to select patients with initial burn evaluations of ≥20% total body surface area. A retrospective review of the electronic medical record will then be completed to collect data associated with the first 7 days of resuscitation efforts. Demographic data such as age, gender, weight, height, and time/date of admission will be collected. The first 24 hours of burn resuscitation will be evaluated in 4 hour increments for adherence with the existing protocol. The following 12 hours will be evaluated for adherence in a similar manner. After the initial 36 hours of resuscitation, patients will be evaluated daily through 7 days after initial presentation. The existing protocol specifically outlines hourly adjustment of fluid resuscitation based upon the previous hours urine output. The addition of vitamin C is indicated for patients with burns covering greater than 30% of total body surface area. The addition of albumin is indicated for patients with sustained decreases in urine output. All relevant data surrounding the use of fluids, vitamin C, and albumin will be collected for analysis. The primary outcome of adherence will be evaluated based on the titration of fluids and the initiation of vitamin C and albumin therapies during the resuscitation period as specified by established protocols. Secondary outcomes will include evaluating the impact vitamin C and/or albumin on the need for renal replacement therapy, rates of infection, and mortality.

Results: Data from approximately 80 patients will be collected, analyzed, and presented at the Ohio Pharmacy Residency Conference.

Conclusions: N/A
Evaluation of an enterprise-wide pharmacist-driven emergency department culture callback and antimicrobial management program

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UAN: 0048-0000-18-097-L04-P

Learning Objectives:
1. Review the types of impactful interventions a pharmacist is capable of making within a culture callback program
2. Describe different follow-up methods for contacting patients in a culture callback program

Purpose:
A culture callback (CCB) program is a systematic follow-up process to ensure that empiric antimicrobials prescribed in the emergency department (ED) are efficacious and appropriate. Multiple studies have shown that pharmacist-driven CCB programs result in an increased number of interventions made post-discharge and a decrease in time to make the interventions. This study aims to provide a qualitative assessment of the pharmacist-driven CCB process.

Methods:
A multi-center, retrospective chart review of ten ED facilities was completed within the Cleveland Clinic enterprise over a 6 week time period. The primary objective was to quantify the number of interventions made by a pharmacist post-discharge from the ED. Secondary objectives include incidence of readmission, time-to-intervention, characterization of interventions, and evaluation of missed interventions.

Results: Interventions were analyzed for 679 patients with a median age of 42 years old. Urine cultures were the most common type of positive culture (308, 43%). Interventions were made on 44% of patients with the most common types of intervention being counseling and initiating treatment. Twelve interventions were missed in total by pharmacy, of which discontinuation of medication when cultures came back negative or insignificant was the most common type. Of the 378 patients that required follow-up, 80% were successfully contacted via phone and 10% via letter.

Conclusions: Our results suggest that pharmacists are able to make impactful interventions on patient care post-discharge from the ED in a timely manner. Almost 44% of patients required an intervention after discharge, indicating the need for stewardship initiatives in the ED.
Impact of FilmArray blood culture identification and antimicrobial stewardship intervention in patients with gram-negative bacteremia

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UAN:0048-0000-18-099-L04-P

Learning Objectives:

1. Describe the technology behind polymerase chain reaction tests.
2. Discuss the impact rapid microbiologic testing has had on patient care at a single health system since implementation in patients with gram-negative bacteremia.

Purpose:
Over the past several decades, antimicrobial resistance has been increasing worldwide. Several emerging antimicrobial-resistant organisms have been responsible for the vast majority of nosocomial infections and cause significant morbidity, mortality, increased hospital length of stay, and cost. Utilizing antimicrobial stewardship and more efficient organism identification methods can help reduce unnecessary antibiotic use. The objective of this study was to evaluate how the use of the FilmArray® Blood Culture Identification (BCID) panel impacts time to optimal therapy in patients with gram-negative bacteremia and acceptance rates of pharmacy interventions compared to culture-based methods at a health system.

Methods:
This retrospective, observational, pre/post quasi-experimental study was conducted from October 1, 2013 through March 6, 2016 in the pre-Biofire group and from March 7, 2016 through June 30, 2017 in the post-Biofire group. We utilized electronic medical records (EMR) to compare time to optimal antibiotic therapy. The primary endpoint was time (in hours) from positive gram stain to optimal therapy. The secondary endpoint was percentage of pharmacy interventions that were accepted within the period noted above, tracked at a single facility. This study was approved by the system institutional review board.

Results: A total of 398 patients met inclusion criteria for data analysis. Post PCR implementation, the time to optimal therapy was reduced from 61.1 hours (+62.2 hours) to 29.5 hours (+54.7 hours) (P

Conclusions: Rapid diagnostic tests reduce the time to optimal antibiotic therapy in patients and potentially reduce unnecessary antibiotic exposure compared to traditional culture methods. Furthermore, utilizing rapid diagnostic tests may increase the acceptance rate of pharmacy interventions.
Bleeding risks for patients on chronic anticoagulation undergoing cardiac implantable electronic device (CIED) lead extraction

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UAN: 0048-0000-18-098-L01-P

Learning Objectives:

1. Describe if patients on chronic anticoagulation are at a higher risk of adverse events than those not on chronic anticoagulation
2. List two factors that may increase patient’s risk of bleeding when undergoing a lead extraction procedure

Purpose:
As the number of patients obtaining a cardiac implantable electronic device (CIED) continues to increase, the number of patients having to undergo lead extraction also continues to rise. A survey completed in 2009 estimated 1.25 million permanent pacemakers (PPM) and 410,000 implantable cardioverter defibrillators (ICD) were placed worldwide. Of the patients undergoing lead extractions, about 40% are on long-term oral anticoagulation. Literature suggests that patients on anticoagulation have a higher risk for adverse events. However, no current study has compared bleeding rates for patients on various oral anticoagulation classes undergoing CIED lead extraction as they relate to the procedure. This exploratory study aims to compare the risk of adverse events for patients on oral anticoagulation versus those that are not and secondarily to compare adverse events between anticoagulants (direct oral anticoagulants versus vitamin K antagonists) and with or without bridge therapy within seven days after the procedure.

Methods:
An IRB approved, retrospective chart review will be performed on all patients who underwent CIED lead extraction at any Ohio State Wexner Medical Center site between January 1, 2013 and January 1, 2018. Using descriptive analysis, chi-squared analysis, and a multivariate analysis, patients who were on chronic anticoagulation will be compared to those who were not on anticoagulation. The primary objective will look at the composite of clinically significant bleeds within 7 days of lead extraction. The secondary objectives will help evaluate the individual components of the primary objective composite, the number of clinically significant thromboses, and total number of minor bleeds within seven days of lead extraction. All of these objectives will then be compared among between different periprocedural anticoagulation strategies.

Results: Data is currently being collected and analyzed. Results will be presented at the Ohio Pharmacy Residency Conference.

Conclusions: Conclusions will be presented at the Ohio Pharmacy Residency Conference.
**Multidisciplinary approach to inpatient medication education and its impact on patient satisfaction scores**

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**UAN: 0048-0000-18-100-L04-P**

**Learning Objectives:**

1. Recognize the goals of Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey and the incentive for organizations to improve HCAHPS scores.
2. Discuss inpatient medication education in a small, community hospital and the opportunity for a multidisciplinary approach.

**Purpose:**
The Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey is a standardized survey tool and data collection method that was developed in 2006 by Centers for Medicare and Medicaid Services (CMS). Because survey results are linked to hospital reimbursement from CMS, organizations have placed great emphasis on improving HCAHPS scores. While pharmacists have been shown to play a role in improving survey scores, opportunity still exists for multidisciplinary collaboration efforts to maximize patient education. This study will evaluate the implementation of a pharmacist-developed multidisciplinary approach to medication education and its impact on HCAHPS survey scores.

**Methods:**
This quasi-experimental study has been deemed non-human research by the Institutional Review Board. The study institution is a 117-bed hospital located in a rural area. A multidisciplinary collaboration was implemented and utilized to improve patient medication education. All patients admitted to this institution were eligible for the new medication education services. The primary outcomes are HCAHPS scores on communication about medicine and transition of care domains. The secondary outcome is 30-day hospital readmission rates. Outcomes will be evaluated and compared pre- and post-implementation of the new processes. Pre-implementation will be evaluated from July through October 2017. Post-implementation will be evaluated January through April 2018. The primary outcome will be analyzed using student’s t-test, and descriptive statistics will be utilized for how many patients were counseled in the time frame.

**Results:** Data is currently being collected and analyzed. Results and conclusions will be presented at OPRC.

**Conclusions:** Data is currently being collected and analyzed. Results and conclusions will be presented at OPRC.
Antibiotic prophylaxis with vancomycin in cardiac surgery and risk of acute kidney injury

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UAN: 0048-0000-101-L01-P

Learning Objectives:

1. Discuss the rationale for adding vancomycin to cefazolin or cefuroxime for surgical prophylaxis in cardiac surgery patients
2. Identify risk factors associated with acute kidney injury in cardiac surgery patients
3. Describe the study evaluating the risk of acute kidney injury (AKI) associated with vancomycin prophylaxis in cardiac surgery patients

Purpose:
Antibiotics are administered to cardiac surgery patients to reduce the rate of surgical site infections, and clinical practice guidelines recommend using either cefazolin or cefuroxime. With increasing prevalence of methicillin-resistant staphylococcus aureus infections in patients undergoing cardiac surgery, the Detroit Medical Center recently started using vancomycin plus cefazolin prophylaxis for cardiac surgery. However, acute kidney injury (AKI) is common after cardiac surgery and vancomycin is known to be nephrotoxic. The purpose of this study is to determine the risk of AKI associated with vancomycin prophylaxis in cardiac surgery patients.

Methods:
This retrospective chart review was submitted to the Institutional Review Board for approval. All adult patients from 2008-2017 who underwent cardiac surgery at Harper University Hospital, Detroit Medical Center, and received antibiotics less than or equal to 48 hours for surgical prophylaxis will be eligible for the study. Patients will be divided into two groups: those who received vancomycin for surgical prophylaxis and those who did not receive vancomycin. The following data will be collected: patient demographics, co-morbidities, preoperative serum creatinine and hemoglobin, antibiotics used for surgical prophylaxis, surgical procedure, use of cardiopulmonary bypass and duration, operation time, post-operative serum creatinine, need for renal replacement therapy, use of nephrotoxic medications, intensive care unit length of stay, hospital length of stay, in-hospital mortality, and occurrence of surgical site infection within 30 days of surgery. The primary outcome of the study is the development of AKI within one week of surgery. AKI will be defined and staged according to the Acute Kidney Injury Network criteria. Data will be reported as means ± standard deviation for continuous variables and as percentages for categorical variables. Chi-square tests will be used to determine if the use of vancomycin is associated with AKI.

Results: Results and conclusions will be presented at the Ohio Pharmacy Residency Conference.

Conclusions: N/A
Assessing the handling of hazardous drug compliance with USP in an academic medical center

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UAN: 0048-0000-18-103-L04-P

Learning Objectives:
1. Identify areas within a hospital setting affected by USP standards
2. Discuss challenges to become compliant with USP

Purpose:
In 2016 the United States Pharmacopeia (USP) unveiled a new chapter focused on hazardous drugs. USP chapter focuses on receiving, storing, compounding, dispensing, administering, and disposing of hazardous drugs with emphasis on patient, employee, and environmental protection. The chapter becomes enforceable on December 1, 2019. The pharmacy has completed initiatives to comply with medication storing, compounding, and dispensing of hazardous drugs. The objective of this evaluation is to compare pre- and post-implementation compliance with USP chapter.

Methods:
This prospective process implementation evaluation will be exempt from review by the Institutional Review Board as it is a quality improvement project. A gap analysis of chapter standards was completed for all elements of hazardous drug handling. A work team was created to identify and target areas of non-compliance. Hospital policies were created and changed to reflect USP standards. The academic medical center’s hazardous drug list was re-assessed for the risk of hazardous potential based on the National Institute for Occupational Safety and Health’s (NIOSH) guidance. Personal protective equipment (PPE) requirements were defined for each NIOSH classification. Barriers to implementation were identified. Descriptive statistics will be used to analyze the data collected.

Results: Results will be presented at the Ohio Pharmacy Residency Conference.

Conclusions: Conclusions will be presented at the Ohio Pharmacy Residency Conference.
De-escalation of anti-methicillin resistant Staphylococcus aureus antibiotics for pneumonia in hospitalized patients with or without Staphylococcus aureus nasal surveillance screening

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Learning Objectives:

1. Discuss the antimicrobial resistance problem.
2. Explain data regarding de-escalation of anti-methicillin resistant Staphylococcus aureus (MRSA) antibiotics with and without SANSS.

Purpose:
Inappropriate antimicrobial use is linked to emergence of multi-drug resistant organisms (MDROs). Antimicrobials are often initiated for respiratory tract infections, including pneumonia. Presence of risk factors for MDROs require empiric pneumonia coverage with a regimen targeted against methicillin resistant Staphylococcus aureus (MRSA). There is limited evidence supporting the use of a specific test targeting antibiotic de-escalation. MRSA colonization, and increased risk for MRSA pneumonia, can be detected using the S. aureus nasal surveillance screening (SANSS). SANSS is favored due to its noninvasive technique and its strong negative predictive value. However, limited evidence is available correlating SANSS with decreased anti-MRSA antibiotic exposure. This study evaluated data regarding de-escalation of anti-MRSA antibiotics with and without SANSS.

Methods:
This single-center, retrospective study in a community hospital setting evaluated time to de-escalation of anti-MRSA antibiotics in suspected and confirmed pneumonia patients pre- and post-implementation of SANSS including subgroup analyses for intensive care unit (ICU) patients. Secondary objectives include comparison of hospital length of stay pre- and post-implementation of SANSS, and number of patients reinitiated on anti-MRSA antibiotics within a 30-day period discontinuation.

Results: The duration of anti-MRSA antibiotic therapy was similar between the post- and pre-SANSS groups (54.5 hours [35.5-69] vs. 45.5 hours [25.25-68.5], respectively; p=0.443). The resulting SANSS negative predictive value in respiratory cultures was 100%, consistent with previously published data.

Conclusions: Duration of anti-MRSA antibiotic therapy was similar in the post-SANSS group overall, which can be attributed to slow turnaround time for culture method used. A larger sample size is warranted to further assess the impact of SANSS in the ICU patient population.
Identifying Barriers That Prevent the Usage of Health Information Exchange in Ohio

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Learning Objectives:

1. Describe what health information exchange (HIE) networks are, and how they can be beneficial
2. Describe responses of pharmacists and providers towards using an HIE network in workflow

Purpose:
Recent literature has described the benefits of having pharmacists review patient charts and utilize clinical information to make therapeutic decisions and reduce medication errors. In a study conducted by Gernant and colleagues, pharmacists were divided into two groups; those completing MTMs using the last 6 months of provider-held patient information, and those who completed MTMs without soliciting the providers for patient information (only used information volunteered by the patient or caregiver). The outcomes of interest were the number of medication related problems and preventative care omissions identified by pharmacists. The pharmacists who solicited for patient health information from providers found significantly more medication related problems than the pharmacists providing usual care (p=0.049). The intervention group also found significantly more omissions (p=0.009) than the usual care group of pharmacists. Currently, one grocery store chain pharmacy is enrolled in an Ohio-based Health Information Exchange (HIE) program; however pharmacists are not currently using it. As clinical services expand in the community setting access to additional patient information may be of increased benefit to patient care.

Methods:
Descriptive research design using two web-based surveys with Likert scales and select-all-that-apply questions; one survey taken by pharmacists, and the other taken by providers. Participants included pharmacies in Ohio, within a grocery store pharmacy chain, that perform highly in clinical services were identified for study inclusion. The pharmacists at the selected stores were surveyed on their perceptions of providing clinical services and communicating with providers using the HIE network. Providers utilizing the HIE network were also surveyed on their perceptions of HIE and communicating with other pharmacists. Survey data was evaluated using descriptive statistics.

Results: Out of 254 pharmacists, there were 102 pharmacists that responded. Also, 83% of the 102 responses completed the survey; other pharmacists did not complete the whole survey. Pharmacists felt that their patients had a desire to work with them, have their information accessible for them, and accept any recommendations that they might have, however the majority of pharmacists that responded (59 out of 85 [69%] of responses) stated that they either disagreed or felt neutral about patients accurately communicating pharmacists’ recommendations to physicians/providers. Pharmacists also felt prepared to start participating in the HIE network. However, some noted barriers of utilizing an HIE included concerns about not enough time or staff to engage in it.

The total number of providers who received the survey cannot be determined, as their survey was sent to them by the HIE network because the network and providers already had an established relationship with one another. The survey was sent out to over 2800 people (which included providers, information technology personnel, investigative officers, etc), and 50 responders identified themselves as providers
(physician assistants, nurse practitioners, nurse case managers, etc). Providers indicated that they enjoy utilizing the HIE network, however there are still barriers such as cost to have access to the HIE, time that it takes to log on and utilize the network, user issues, and the speed of the network continue to make it challenging to use. In regards to utilizing the HIE to communicate with pharmacists, 75% of providers (36 out of 48 responders) stated that they do not refer patients to community pharmacists, even though 66% of providers stated that they were aware of the services provided by community pharmacists (medication therapy management, immunizations, smoking cessation programs, diabetes coaching, etc).

**Conclusions:** Most pharmacists want to use an HIE in their daily work, however they may need support from pharmacy staff and scheduling. Also, providers still stated that they utilize the HIE to access complete medication records, to review discharge medications or medication reconciliations. Community pharmacists updating patient medication records could be a starting point in working with providers to enhance patient care. Limitations of this study include a low response rate from providers, and incomplete responses from both groups of survey takers.
Evaluation of time to first dose antibiotic administration in patients with suspected sepsis or septic shock

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UAN: 0048-0000-18-106-L01-P

Learning Objectives:

1. Describe the importance of timely and appropriate antibiotic administration in patients with suspected sepsis or septic shock
2. Identify potential sources for delayed administration of antibiotics

Purpose:
The 2016 Surviving Sepsis Guidelines recommend initiation of empiric antibiotic treatment within one hour of sepsis recognition and diagnosis. Each hour of delay in antibiotic administration, following the onset of hypotension in septic shock patients, decreases patient survival by 7.6%. Delays can occur at different points in the medication use process, including ordering, dispensing and administration. In addition to appropriate antibiotic timing, adequate antibiotic dosing and selection are essential. It is strongly recommended in the Surviving Sepsis Guidelines that broad spectrum antibiotics with good coverage and penetration to the suspected site of infection are selected when empirically treating patients with sepsis. UHCMC medical intensive care unit (ICU) uses an Empirical Antibiotic Therapy Guideline to direct antimicrobial choices for newly admitted patients. The objective of this research is to assess the impact of readily available broad spectrum antibiotics on administration time in patients with suspected sepsis or septic shock.

Methods:
This study was approved by the Institutional Review Board. This project was a single center, retrospective chart review examining antibiotic administration in patients with suspected sepsis or septic shock. Patients who received a new start of antibiotics for sepsis or septic shock in the medical ICU from December 1, 2016 through March 31, 2017 and April 1, 2017 through July 31, 2017 were included. The primary outcome was the median time to first dose antibiotic administration. Secondary outcomes included priority of ordered antibiotic, sources of delay, selection and dose of antibiotics ordered based on the medical ICU guidelines, duration of hypotension and ICU length of stay, and ICU mortality. Data has been analyzed using descriptive statistics.

Results: Final results will be presented at the Ohio Pharmacy Residency Conference.

Conclusions: Conclusions will be presented at the Ohio Pharmacy Residency Conference
Description of Non-adherence in a Free Clinic

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UAN: 0048-0000-18-227-L04-P

Learning Objectives:
1. Describe the patient population of a free clinic.
2. Identify common barriers to medication adherence in a free clinic.

Purpose:
While non-adherence has been widely studied, there is a lack of evidence about barriers to care and non-adherence in the underserved population; there is an even larger gap of literature specifically in the free clinic setting. Because insurance, cost, and poor coordination of care has been circumvented by the interdisciplinary, free-of-charge model at Health Partners Free Clinic, a study was designed to investigate if there are further institutional and social barriers that are preventing patients from accepting and utilizing medications freely available to them.

Method:
A descriptive survey-based study was done at Health Partners Free Clinic in Troy, Ohio using the Adherence Barriers Questionnaire to assess barriers to medication adherence. Included in this survey was open ended questions aimed at identifying specific patient situations leading to non-adherence as well as any part of clinic workflow that may be improved. Any scheduled patient 18 years and older during December, 2017 and January, 2018 was given the opportunity to fill out a survey. Those with less than one prescription medication were excluded from calculation of proportion of days covered.

Results:
A total of 121 surveys were collected. Of the subjects, 73 were female, 46 were male, 1 identified as other, and 1 preferred not to answer. Men scored higher than women for intentional non-adherence (8.2 ± 2.072, p=0.034). Respondents with medical insurance (8.23 ± 2.078, p=0.043) and prescription insurance (8.27 ± 2.122, p=0.038) scored higher in medication related barriers. Respondents with intentional barriers (9.12 ± 2.288, p=0.031) and unintentional barriers (8.71 ± 2.201, p=0.027) stated that accepting free services bothered them a moderate amount. Information from 33 patients was available to calculate an average proportion of days covered of 81.61%.

Conclusion:
The results of this study will assist Health Partners Free Clinic’s efforts to improve medication adherence.
Clinical Safety and Efficacy of Prolonged Intravenous Administration of Lacosamide

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UAN: 0048-0000-18-107-L01-P

Learning Objectives:

1. Review current literature regarding intravenous lacosamide use in patients with seizures
2. Report the safety and efficacy for the use of intravenous lacosamide beyond the 5-day recommended duration

Purpose:
Despite previous studies demonstrating the safety and efficacy of intravenous (IV) lacosamide use, recommending its use beyond 5 days is met with limited supporting evidence. However, oftentimes there is a need for prolonged use during hospital admission if patients are unable to tolerate oral therapy. Therefore, the purpose of this study is to evaluate the safety and efficacy of IV lacosamide utilization beyond the recommended 5-day period in patients with seizures.

Methods:
This was a single-center, retrospective chart review utilizing an electronic medical record database (Epic©) between November 1, 2016 and December 31, 2017. All adult patients were included if they received IV lacosamide for a duration beyond 5 days. Pediatric patients and patients on less than 5 days of IV lacosamide were excluded. Demographic variables and clinical parameters were collected. The primary outcome is to evaluate neurologic, cardiovascular, and infusion related adverse effects with IV lacosamide treatment. The secondary outcome is to assess changes in seizure frequency based on electroencephalography interpretation.

Results: Data is currently being analyzed. Results and conclusions will be presented at the Ohio Pharmacy Resident Conference.

Conclusions: Data is currently being analyzed. Results and conclusions will be presented at the Ohio Pharmacy Resident Conference.
Evaluation of alternative anticoagulant use in heparin-induced thrombocytopenia

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UAN: 0048-0000-18-108-L01-P

Learning Objectives:

1. Describe the benefit of using non-argatroban anticoagulants for heparin-induced thrombocytopenia (HIT)
2. Discuss the existing literature support for fondaparinux, rivaroxaban and apixaban for HIT management

Purpose:
Heparin-induced thrombocytopenia (HIT) is an immune-mediated syndrome which may lead to serious thrombotic complications. Argatroban has traditionally been used as the non-heparin anticoagulant to manage HIT. The objectives of this project were to characterize the challenges of managing argatroban therapy and to assess the economic impact of using fondaparinux, rivaroxaban, or apixaban in place of argatroban for HIT management.

Methods:
A retrospective chart review of approximately 150 patients who received argatroban for the management of HIT was performed. In adult patients, the use of alternative anticoagulants was evaluated using specific eligibility criteria (e.g. renal function, anticipated procedures, concomitant medications). Included patients underwent a comprehensive chart review. Data collected included patient demographics, relevant laboratory results, pharmacist notes/interventions, and argatroban therapy. A cost analysis was performed. Descriptive statistics were employed to present findings.

Results: Preliminary data on twelve patients (15 total encounters) resulted in an average age and weight of 59.8 years and 107.9 kg, respectively. One-third of patients underwent surgical procedures and 40% were in the ICU at some point. Half of the patients had laboratory confirmed HIT with one patient having HIT with thrombosis. An average of 10.2 activated partial thromboplastin time tests were run per encounter with 86.2% being therapeutic. There was an average of 10 pharmacist notes for each course of argatroban. One-third of patients transitioned to warfarin had information suggesting an increased length of stay due to the transition. The institution cost savings for using an alternative agent for the entire course of therapy in the 15 encounters was approximately $45,000 for fondaparinux and $16,000 from rivaroxaban or apixaban.

Conclusions: Challenges with argatroban therapy include potential thrombotic risk when medication is on hold, the need for close monitoring, and the suggestion of increased length of stay. The projected intuitional cost savings from alternative agents is expected to be significant.
Efficacy of area under the curve (AUC) dosing of vancomycin in patients with serious methicillin resistant Staphylococcus aureus (MRSA) infection

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UAN: 0048-0000-18-109-L01-P

Learning Objectives:

1. Describe the rationale for using AUC-directed dosing of vancomycin for the treatment of serious MRSA infections
2. Identify common types of MRSA infections where AUC-directed dosing of vancomycin may be preferred over trough-directed dosing

Purpose:

Background: Vancomycin is a glycopeptide antibiotic used for the treatment of MRSA infections. Historically, trough levels have been used to evaluate vancomycin dosing with guidelines recommending trough levels of 15 to 20 mg/L for the treatment of serious MRSA infections. There is strong evidence linking higher vancomycin troughs to an increased risk of nephrotoxicity with limited clinical evidence on improved efficacy. Literature suggests that dosing vancomycin based on AUC (versus trough levels) decreases the risk of nephrotoxicity, but further investigation regarding the effectiveness of dosing by AUC is warranted. This study will describe the efficacy of AUC dosing.

Methods:

Methods: This Institutional Review Board (IRB) approved study was a retrospective chart review performed at a community-teaching hospital. Patients were identified via lab report showing any positive MRSA culture (excluding urine, central nervous system, and superficial wound cultures) during their hospital admission between the dates of April 1, 2017 and September 30, 2017 (AUC dosing) as well as April 1, 2016 and September 30, 2016 (trough-directed dosing). Pertinent patient data was collected from the electronic medical record (EMR) including: patient demographics and characteristics, duration of hospital stay, laboratory data, vancomycin regimen characteristics, and reason for discontinuation of vancomycin therapy. Data was evaluated and compared utilizing appropriate statistical methods.

Results: Data is currently being analyzed. Results and conclusions will be presented at the Ohio Pharmacy Residency Conference.

Conclusions: Data is currently being analyzed. Results and conclusions will be presented at the Ohio Pharmacy Residency Conference.
Implementation of pharmacist consult agreements with physicians for the management of chronic, non-cancerous pain in the ambulatory care setting: Physician viewpoint

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UAN 0048-0000-18-110-L04-P

Learning Objectives:

1. Review updates to the rules governing pharmacist consult agreements with physicians
2. Discuss survey results regarding the extent that primary-care physicians associated with the Blanchard Valley Health System and near Findlay, Ohio would like to implement consult agreements with pharmacists at their practice sites

Purpose:
Updated rules governing pharmacist consult agreements went into effect on October 1, 2017. With the growing need for proper management of chronic pain and increased frequency of primary-care visits, pharmacists could play a major role in optimizing pain regimens and filling this gap in care. The objective of this study is to gather primary-care physician opinion on the extent of pharmacist involvement they wish to include when implementing consult agreements for the management of chronic, non-cancerous pain in clinical practice.

Methods:
The study was exempt from Institutional Review Board approval. A survey was sent to family practice physicians associated with the Blanchard Valley Health System or near Findlay, Ohio. It asked physicians to select components they would authorize a pharmacist to perform including: changing the duration of treatment, adjusting the strength, dose, dosage form, frequency, administration, or route of administration, discontinue the use of a drug, administer a drug if the drug is included in the consult agreement, add a drug to a patient’s therapy, order blood or urine tests, or evaluate results of blood or urine tests if related to the drug therapy being managed. It gathered viewpoints on pharmacists prescribing of controlled substances, should this become approved by the Drug Enforcement Agency, and whether a pharmacist will be on-site, off-site or contacted via phone or skype. Physicians had the opportunity to list other services of interest and provide additional comments.

Results: Survey responses regarding the extent of pharmacist involvement in consult agreements will be discussed.

Conclusions: Information collected may be used as feedback for potential first steps to implement these agreements with select physicians that are more eager to involve a pharmacist, where each agreement will need to be tailored to a given disease state and practice setting.
Evaluation of a pharmacist driven population health program assessing appropriateness of statin therapy based on atherosclerotic cardiovascular disease risk (ASCVD) scores in a private insured employer population

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UAN: 0048-0000-18-111-L01-P

Learning Objectives:

1. Describe how population health improves patient outcomes
2. Outline statin benefit groups used to determine appropriate statin therapy based on the 2013 ACC/AHA guidelines

Purpose:
The purpose of this study was to determine outcomes associated with a population health management program within a patient-centered medical home (PCMH) from January 2016 – December 2016. The primary objective is to evaluate the implementation of a pharmacist driven initiative aimed to decrease cardiovascular risk in a private employer-insured population.

Methods:
A systematic approach was used to screen patients to assess appropriate statin therapy according to 2013 ACC/AHA Guideline on the Treatment of Blood Cholesterol to Reduce Atherosclerotic Cardiovascular Risk in Adults. Pharmacists calculated 10 year atherosclerotic cardiovascular disease (ASCVD) risk score for each patient to decide if statin therapy needed to be initiated or intensity increased. For patients with identified interventions, recommendations were discussed with the primary care provider. If the provider accepted the recommendation, the patient was engaged in informed decision making to determine the final outcome. To ensure the recommended medication ultimately reached the patients, medication fill history provided by the private insurer was evaluated.

Results: Pharmacists evaluated 6460 patients. Interventions were made to the primary care provider for 2626 patients, of which 917 were medication related to increase or initiate statin therapy. Of the 917 recommendations, 415 (45.2%) were accepted by the primary care provider. All of the 415 recommendations were discussed with the patient of which 222 (53.4%) were accepted.

Conclusions: NA (research in progress)
Comparative effectiveness of vancomycin, daptomycin, and ceftaroline regimens for complicated methicillin-resistant Staphylococcus aureus bacteremia

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UAN: 0048-0000-18-112-L01-P

Learning Objectives:

1. Explain the difference between complicated and uncomplicated bacteremia
2. Compare antibiotic regimens for complicated MSRA bacteremia

Purpose:
The purpose of this study is to compare the efficacy of vancomycin, daptomycin, and ceftaroline regimens for treating complicated methicillin-resistant Staphylococcus aureus bacteremia

Methods:
This study is a retrospective chart review of patients admitted to Kettering Health Network hospitals with a diagnosis of complicated methicillin-resistant Staphylococcus aureus bacteremia. Data was collected for patients admitted January 1, 2015 through December 31, 2017.

Results: Data are collected and are currently being analyzed.

Conclusions: N/A
Evaluation of pharmacist involvement in Chronic Obstructive Pulmonary Disease (COPD) inhaler education

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UAN: 0048-0000-18-228-L01-P

Learning Objectives:

1. Describe the impact that pharmacists have had on inhaler education.
2. Discuss ambulatory pharmacy inhaler education and assessment and impact on patient care and outcomes.

Purpose:
Chronic Obstructive Pulmonary Disease (COPD) is a health problem associated with significant morbidity and mortality. Standard therapy for COPD consists of inhaled pharmacologic agents. However, patients do not always know how to use inhaler devices, and often make critical errors. The 2017 GOLD guidelines include an emphasis on inhaler education to ensure that patients are using their inhalers correctly before adding additional medications. Previous research shows a positive patient impact when pharmacists provide inhaler technique education. The purpose of this study is to evaluate the impact of pharmacists providing inhaler education in an ambulatory setting.

Methods:
This is a prospective study of a new pharmacy initiated process in a family medicine physician’s office and a home visit outreach program. Pharmacy is available at least two days a week in office, and screens the providers’ schedule for the day to determine which patients have inhalers on their outpatient medication list. Education is then provided to as many patients as possible during the time that the pharmacy team is in clinic. For patients of the outreach program, education will be provided during home visits. For patients with COPD, the COPD Assessment Test (CAT) is administered to patients along with inhaler technique education. Recommendations are made to patients to improve their inhaler use. Follow-up 4-6 weeks post-education is conducted to reassess CAT score and reiterate inhaler technique. Primary outcome will be change in CAT score from baseline to 4-6 week follow up. Other outcomes assessed include frequency of rescue inhaler use, number and type of recommendations made to patient, number and type of recommendations made to provider, and number and type of accepted recommendations.

Results: Data collection in process, preliminary results expected by spring 2018.

Conclusions: Data collection in process, preliminary results expected by spring 2018.
Impact of an order set modification on pharmacologic venous thromboembolism prophylaxis in patients with class III obesity

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UAN: 0048-0000-18-114-L01-P

Learning Objectives:

1. Describe the potential for usage of weight-adjusted venous thromboembolism prophylaxis in patients with obesity
2. Explain the impact of a venous thromboembolism prophylaxis order set modification on prescribing patterns at a large tertiary-care academic medical center

Purpose:
Venous thromboembolism (VTE) is a preventable illness in hospitalized patients. The study site has a VTE risk assessment tool based on the Caprini score available for prescriber order entry. The tool was updated in 2015 to include risk factors for body mass index (BMI) ranges, automatic selection of some demographic risks, and expansion on other risk factors. After the update, higher-dose, weight-adjusted heparin and enoxaparin were recommended for obese patients. The purpose of this study is to evaluate the effect of the updated assessment tool on prescribing patterns and to analyze the safety and efficacy of weight-adjusted heparin and enoxaparin when used for VTE prophylaxis in obese patients at UHCMC.

Methods:
This is a retrospective chart review of obese (BMI ≥40 kg/m^2) adult (age ≥18 years) patients who received heparin or enoxaparin for VTE prophylaxis before and after the order set modification. Patients were excluded if they had VTE, clinically-significant bleeding, or therapeutic anticoagulation on admission, pregnancy, admission for hip/knee replacement or trauma, length of stay

Results: Patients screened using the VTE risk assessment tool after its modification were more likely (RR: 7.73; 95% confidence interval: 4.40–13.58) to receive weight-adjusted thromboprophylaxis. There was no statistically significant difference between number of major bleeding (p=0.12) and VTE (p=0.93) events when comparing weight-adjusted and non-weight-adjusted cohorts. Seven out of eight patients with major bleeding were surgical patients.

Conclusions: Implementation of weight-adjusted dosing recommendations for obese patients in a VTE risk screening tool can lead to increased utilization of weight-adjusted pharmacologic thromboprophylaxis. No difference in major bleeding or VTE occurrence was shown between weight-adjusted and non-weight-adjusted regimens of heparin and enoxaparin.
Comparison of Insulin Detemir and Insulin Glargine use in Hospitalized Diabetic Patients

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Christopher Giuliano, PharmD, MPH, Wayne State University Eugene Applebaum College of Pharmacy and Health Sciences, St. John Hospital and Medical Center; Carrie Hartner, PharmD, BCPS, St. John Hospital and Medical Center

UAN: 0048-0000-18-115-L01-P

Learning Objectives:
1. Describe the benefits of long acting insulin analogues in the treatment of diabetes mellitus
2. Discuss the safety and efficacy of insulin detemir versus glargine in the inpatient setting

Purpose:
Long-acting insulin analogues such as insulin detemir and glargine are mainstays of therapy in blood glucose management. These two agents exhibit similar pharmacokinetic and pharmacodynamic profiles, allowing for a prolonged duration of action and peakless effect on blood glucose. Several studies have compared insulin detemir and glargine in the ambulatory care setting, although data is lacking for hospitalized patients. The purpose of this study is to compare the efficacy and safety of insulin detemir and glargine by exploring the incidence of hypoglycemia and hyperglycemia in hospitalized diabetic patients.

Methods:
This retrospective single center cohort study from January 2010 to November 2017 will evaluate adult patients with a diagnosis of diabetes (type 1 or type 2). Patients who are pregnant, receiving continuous insulin infusions, receiving long acting insulin for less than 72 hours, or admitted to an intensive care unit (ICU) will be excluded. The primary outcome will compare the proportion of patients who experience hypoglycemic events within 72 hours of initiation (of insulin detemir or glargine). Secondary outcomes will compare the proportion of patients who experience hyperglycemic events, total number of hypoglycemic events, and total daily insulin requirements within 72 hours of initiation between the two cohorts. Data was collected electronically using electronic medical records, with ICD 9 and 10 codes for disease state identification. Descriptive statistics will be used for categorical variables. Differences between the cohorts will be assessed using Student’s t-test and Mann Whitney U or chi squared test. Multivariable logistic regression will be conducted using hypoglycemia as the dependent variable and insulin type (detemir or glargine) as the primary predictor of interest.

Results: Data collection is finished, analysis is being conducted; results will be presented at the 2018 Ohio Pharmacy Resident Conference.

Conclusions: Conclusions will be presented at the 2018 Ohio Pharmacy Resident Conference.
Minimizing time to optimal therapy for Enterobacteriaceae bloodstream infections: Is organism identification enough?

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UAN: 0048-0000-18-116-L04-P

Learning Objectives:

1. Compare the performance of different methodologies to predict the likelihood of blood stream infections due to ceftriaxone-resistant Enterobacteriaceae
2. Assess the strengths and limitations of current scoring tools to predict ceftriaxone-resistant Enterobacteriaceae
3. Explain the risks of utilizing treatment algorithms with poor predictability

Purpose:
Bloodstream infections (BSIs) due to ceftriaxone (CRO) resistant enterobacteriaceae are increasing in frequency and are associated with delays in time to appropriate therapy. However, placing all patients at risk for CRO-resistant organisms on empiric carbapenem therapy risks over exposure to carbapenems. Strategies are needed to appropriately balance these competing interests. The purpose of this study is to compare three published methods for accomplishing this.

Methods:
Retrospective observational study of adult patients at the Detroit Medical Center with Enterobacteriaceae BSI from July 1, 2016 to July 31, 2017. Patients with E. coli, K. oxytoca, K. pneumoniae, or P. mirabilis were included if Verigene® GN-BC and traditional microbiology both detected the organism. Patients were excluded if carbapenem resistance was detected via genetic markers. This study assessed the effectiveness of three methods to detect and/or predict CRO resistance at the time of organism identification. Methods 1 and 2 were based on published scoring tools for identifying extended spectrum beta-lactamase (ESBL) producing enterobacteriaceae. If the patient met the cutoff score they were hypothetically placed on a carbapenem, if they did not they were placed on CRO. Method 3 was based on results from Verigene. If the CTX-M marker was positive they were hypothetically placed on a carbapenem, if not CRO. The methods were compared for their sensitivity, specificity, predictive values, and the number of times they would have led to inappropriate therapy or unnecessary escalation to carbapenems.

Results: 453 Enterobacteriaceae isolates were included in this analysis, and 73 (16%) were CRO-resistant. The comparative effectiveness of the different methods was assessed. Using detection of CTX-M to predict CRO-resistance, Verigene had a 85% sensitivity, 99.7% specificity, 98% predictive value (PPV), 97% negative predictive value (NPV). In addition, use of Verigene led to 11 inappropriate therapies with 1 patient receiving a carbapenem unnecessarily. Lee et al. used a cutoff score of 2 to predict CRO-resistance. With this methodology, the sensitivity was 32%, specificity 91%, PPV 40%, and NPV 87%. 50 patients would be inappropriately treated and 35 patients received carbapenems unnecessarily. Lastly Augustine et al. used a cutoff score of 3 or a cutoff score of 1-2 in a critically ill patient to predict CRO-resistance. This achieved 37% sensitivity, 87% specificity, 36% PPV, and 88% NPV. 46 patients were inappropriately treated and 48 patients were given unnecessary carbapenems. With modification to the Augustine to use only a cutoff score of 3 to predict a CRO-resistance, there was a 29% sensitivity, 89% specificity, 34% PPV, and 87% NPV. Inappropriate therapy was used in 52 patients and carbapenems were given unnecessarily to 41 patients.

Conclusions: Verigene CTX-M presence/absence as a marker of the need for carbapenem therapy was associated with fewer cases of undertreatment and overtreatment. Published ESBL scoring tools performed poorly.
Testing the Untestable: Evaluation of monitoring direct oral anticoagulants in a pharmacist-run anticoagulation clinic

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UAN0048-0000-18-117-L01-P

Learning Objectives:

1. Review FDA-labeled indications of direct oral anticoagulants (DOACs)
2. Describe potential monitoring parameters of DOACs

Purpose:
To identify differences in the number of interventions for rivaroxaban and apixaban monitoring done at one-month, three-month, and six-month intervals in a pharmacist run-anticoagulation clinic.

Methods:
Male and female patients enrolled in the anticoagulation clinic and currently prescribed a DOAC agent (rivaroxaban, apixaban) as of October 1, 2016 for an FDA-labeled indication were assessed via retrospective chart review. Patients were studied retrospectively from October 1, 2015 – October 1, 2017. Each documented clinic visit between the patient and ACC during the two-year period was assessed. Data collection included date of clinic visit, interventions made by a pharmacist (i.e. dose increase, dose decrease, change in follow-up), and reason for intervention (i.e. change in renal function, bleeding event).

Results: There were 52 interventions made from 495 clinic visits. Fifteen percent of the clinic visits at the one-month monitoring interval led to an intervention, compared to 9% at the three-months monitoring interval, and 10% at the six-month monitoring interval. Five (4.4%) dose adjustments were made during one-month interval monitoring, 13 (4%) dose adjustments made during three-month interval monitoring, and 2 (3.4%) dose adjustments were made during six-month interval monitoring. The most common type of intervention was change in follow-up frequency and the most common reason for intervention was change in renal function.

Conclusions: Six-month monitoring may be appropriate for most patients prescribed a DOAC agent, except for patients with borderline renal function and those with a history of bleeding event. Additionally, Child-Pugh classification may be more accurate than AST/ALT results to monitor liver function and assess appropriateness of continued treatment with a DOAC agent.
Implementation of a pharmacist-led Diabetes Prevention Program in a community hospital’s ambulatory care clinic

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Learning Objectives:

1. Describe the impact of an intensive lifestyle modification program on preventing the progression from prediabetes to type II diabetes.
2. Discuss the challenges and successes of a pharmacist-led pilot study of the Diabetes Prevention Program.

Purpose:
Prediabetes affects one third of American adults and is associated with an increased risk of diabetes and cardiovascular disease; however, only ten percent of these patients are formally diagnosed. The National Diabetes Prevention Program study demonstrated that an intense lifestyle modification program alone was more effective than the combination of standard lifestyle counseling and metformin in preventing diabetes in at-risk patients. The purpose of this study is to determine the impact of a pharmacist-led Diabetes Prevention Program (DPP) on the incidence of progression of prediabetes to diabetes, as measured by change in hemoglobin A1c (HbA1c) after ninety days of participation in the program.

Methods:
After evaluation of annual wellness visits, employees of our institution were determined to be eligible for participation in the study if they had a diagnosis of prediabetes or met the HbA1c diagnosis criteria for prediabetes of 5.7-6.4%. Pharmacists led weekly group sessions using the Centers for Disease Control and Prevention’s PreventT2 Curriculum, which is modeled after the National DPP study. The DPP defines intense lifestyle modifications as working towards the goals of a seven percent weight loss and 150 minutes of moderate-intensity physical activity per week. Participants weighed in and reported activity logs at every session in order to track progress. HbA1c data was collected at baseline and was reassessed after ninety days. The primary outcome included the change in HbA1c after ninety days. A secondary outcome included an assessment of the patients’ understanding of prediabetes at baseline compared to reassessment after ninety days of participation.

Results: Research is still in progress and results will be presented at the Ohio Pharmacy Resident Conference.

Conclusions: Not applicable at time of writing as research is in progress.
Utilization of Pharmacist Visits in Reducing Potentially Inappropriate Medications (PIMs) in Hospice Patients

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Lacey Davis, PharmD, BCPS, BCGP and Kathleen Senger, MD

UAN: 0048-0000-18-119-L04-P

Learning Objectives:
1. Outline an approach to counseling patients and family members on discontinuation of PIMs.
2. Discuss the impact of pharmacist provided medication counseling on PIMs discontinued, decrease in pill burden, decrease in medication costs, and overall patient satisfaction.
3. Identify future directions and opportunities for pharmacist provided counseling in the hospice setting.

Purpose:
The purpose of this study is to investigate the role a pharmacist can play in the hospice setting to reduce the use of inappropriate medications by providing education and information to patients and families.

Methods:
This prospective interventional study was approved by the Institutional Review Board before implementation. Home hospice and respite patients' medication profiles were reviewed and through discussion with the patient's physician, the pharmacist identified potentially inappropriate medications (PIMs) that may be appropriate to discontinue. Medication classes considered included antihyperlipidemics, antiglycemic agents, vitamins/supplements, and inhalers to name a few. The patient's life expectancy versus time to therapeutic benefit, renal/hepatic insufficiencies, age, and the patient's goals of care were taken into consideration. The pharmacist then counseled the patients and/or families on the benefits of discontinuing these PIMs. The percentage of PIMs discontinued after the counseling was evaluated, as well as the decrease in pill burden and decrease in medication costs. Patient and family survey satisfaction calls were conducted at least one month following the counseling to assess the quality of these visits, decrease in possible side effects from the medications, and satisfaction of the patient's overall symptom management. All data has been recorded without patient identifiers and no patient information will be reported in the results. Comparator groups are pre-pharmacist visit versus post-pharmacist visit.

Results: Data assessment is ongoing with preliminary results of 26 patients receiving pharmacist counseling. 75 PIMs were identified in these patients, with 63 (84%) being discontinued at the time of the pharmacist visit. There was an average of 10.88 medication administrations per day prior to counseling among the participants, which was decreased to an average of 7.57 medication administrations per day after counseling. Cost savings ranged from $3.44 to $653.38 for 15 day supplies of discontinued medications. Data collection of the patient/family satisfaction survey calls is ongoing. Final results will be presented at the Ohio Pharmacy Residency Conference.

Conclusions: Based on assessment of the preliminary results, increased utilization of the pharmacist in patient and family counseling sessions in the hospice setting has shown to decrease the use of PIMs, decrease pill burden for patients, lower medication costs, and overall improve patient outcomes.
**Impact of Provider Accepted, Pharmacist-Initiated Interventions on A1c Outcomes in Underserved Populations Disproportionately Affected By Diabetes**

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Lydia Bailey, PharmD; Russell Curington, PharmD, BC-ADM; Bethanne Brown, PharmD, BCACP; Mike Espel, RPh

**UAN: 0048-0000-18-120-L01-P**

**Learning Objectives:**

1. Identify appropriate diabetes management interventions made by pharmacists as defined by the OutcomesMTM platform.
2. In your practice site, discuss how OutcomesMTM could be used to support the expansion of collaborative practice agreements.
3. Compare published literature about the success of pharmacist medication management to the results of this study.

**Purpose:**
While literature clearly links pharmacist involvement in diabetes management as beneficial, the application to a community pharmacy patient population disproportionately affected by diabetes is not well defined. Literature regarding the correlation between prescriber acceptance of pharmacist recommendations and improved diabetes control for the underserved is scarce but important to support the expansion of collaborative practice agreements (CPAs). The purpose of this study is to determine the correlation between provider acceptance of pharmacist-initiated diabetes drug management recommendations and changes in hemoglobin A1c (A1c).

**Methods:**
This institutional review board approved study utilized OutcomesMTM to identify and gather all pharmacist-initiated drug management interventions from April 1, 2015 to July 31, 2017. The data collected included: patient name, all A1c values for each patient, dates the tests were performed, and number and type of pharmacist-initiated diabetes drug management claims. Data was analyzed using the Pearson R correlation. The accepted interventions with the greatest calculated total A1c reduction were also identified. All data was recorded without patient identifiers and stored to maintain confidentiality.

**Results:** A total of 5924 pharmacist-initiated interventions were identified for 527 unique patients over the defined study period. A total of 4169 (70%) of these interventions were approved by the provider. The A1c values analyzed for this study reflected the first and last value reported for each individual patient. The R-value for the correlation between number of provider accepted recommendations and any decrease in A1c was: 0.0811 (P= 0.408556). The R-value for the correlation between the number of accepted recommendations and any increase in A1c was: 0.1066 (P= 0.224619).

**Conclusions:** For this study, the number of total provider-accepted, pharmacist-initiated interventions had no correlation with the patient’s improvement in diabetes control as reflected in A1c values. At this time, the direct effect of each individual accepted or rejected pharmacist-initiated recommendation on A1c outcomes cannot be determined. Future studies should focus on the specific impact of each accepted pharmacist-initiated diabetes management intervention on patient A1c at least 3-months, but no greater than 6-month from the specific intervention.
Evaluation and Management of Direct Oral Anticoagulants in Special Populations with Atrial Fibrillation

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UAN: 0048-0000-18-121-L01-P

Learning Objectives:

1. Identify special patient populations that lack guidance for use of direct oral anticoagulants (DOACs) in patients with atrial fibrillation.
2. Explain the advantages and disadvantages of direct oral anticoagulants in comparison to vitamin K antagonists (VKA).

Purpose:
Management of thromboembolism prevention in atrial fibrillation has recently changed with the availability of DOACs, therefore providing an alternative to VKA in preventing thromboembolic events. To date, DOACs represent important advantages over VKA. However, patient clinical factors, including renal impairment, hepatic impairment and extremes in weight, may complicate the management of preventing thromboembolism or cause the prescriber to question the best treatment option due to lack of clinical data or exclusion of these patient populations in DOAC trials. Due to lack of guidance on management of these patient populations, the purpose of this study is to evaluate patient characteristics, the general management of DOAC therapy in atrial fibrillation and the occurrence of undesirable patient outcomes in patients who met criteria for special patient populations.

Methods:
This is a single-center retrospective study of adult patients with atrial fibrillation who received at least one dose of apixaban, dabigatran, or rivaroxaban from June 1, 2017 through August 31, 2017. Patients were identified through the electronic medical record and were included if they received at least one dose of a DOAC during admission and met criteria for special patient populations which consisted of renal impairment, hepatic impairment and extremes in weight. Extremes in weight were defined as either obesity (body mass index [BMI] &gt; 40 kg/m2 or &gt;120 kg) or low body weight (BMI &lt; 18.5 kg/m2 or ≤ 50 kg). Patients were excluded if they had documented cardiac valve disease and/or their DOAC was prescribed for dual indications.

Results: Data is currently being collected and analyzed. Results and conclusions will be presented at the Ohio Pharmacy Residency Conference.

Conclusions: Data is currently being collected and analyzed. Results and conclusions will be presented at the Ohio Pharmacy Residency Conference.
Evaluation of influenza vaccination rates in the anticoagulation clinic patient population

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UAN: 0048-0000-18-122-L01-P

Learning Objectives:

1. Describe how pharmacists have increased influenza vaccination rates
2. Recognize the controversy surrounding the influenza vaccine’s effect on the INR

Purpose:
Adult vaccination rates in the United States are not meeting the target of 70% set by HealthyPeople 2020. For patients taking warfarin, there is controversy whether the influenza vaccine affects the International Normalized Ratio (INR). The objectives of this study were to evaluate the rate of influenza vaccination and any effects on the INR following vaccine administration for patients seen in an anticoagulation clinic. This study will help determine the potential benefit of initiating a future influenza vaccination program at MHSVMC anticoagulation clinics.

Methods:
A retrospective chart review was conducted and included adult subjects taking warfarin and attending at least one anticoagulation clinic appointment between August 1st 2016 to April 30th 2017. Variables collected included: influenza vaccination status, vaccine contraindications, bleeding from the vaccination site, post-vaccination INR and confounding variables for INR changes. The primary endpoint was the influenza vaccination rate during the study period. Secondary endpoints included: comparison of the influenza vaccination rates between adults aged 18 to 64 years and geriatric subjects 65 years of age and over, and the vaccine impact on the INR.

Results: The influenza vaccination rate was 42.6% for the 326 subjects included. The rate for geriatric subjects was 47.8% compared to 38.9% for subjects 18-64 years old. Only twenty-one subjects had a documented vaccine contraindication or refusal, and no subjects experienced vaccination site bleeding. Of the 139 subjects who received the influenza vaccine, fifty-three (38.1%) had post-vaccination INR values outside of the therapeutic range. However, this could also be attributed to a confounding variable in most cases.

Conclusions: The influenza vaccination rate was found to be below the established target. Based on this, it may be beneficial to initiate a vaccination program at MH SVMC anticoagulation clinics. It was challenging to assess the impact of influenza vaccine on INR due to confounding variables.
Evaluating the Impact of a Pharmacist Led Antibiotic Time Out

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Christine Yost, PharmD and Prakash Shah, PharmD

UAN: 0048-0000-18-123-L04-P

Learning Objectives:

1. Discuss the CDC Core Elements of Hospital Antibiotic Stewardship Program
2. Describe the pharmacy-driven interventions regarding an antibiotic time out
3. Evaluate the impact of a pharmacist led antibiotic time out

Purpose:
Over half of hospitalized patients will receive at least one dose of an antibiotic. Unfortunately up to 50% of antibiotics are either unwarranted or inappropriate and overuse of antibiotics increases the risk of undesirable side effects, bacterial resistance, and hospital costs. To help identify antibiotics that can be adjusted, stopped, or changed to a different antibiotic, the Centers for Disease Control and Prevention recommends a formal antibiotic “time out” where antibiotic orders are re-evaluated within 48-hours of initiation. Pharmacists can potentially assist with antibiotic time outs by assessing antibiotic therapy for correct dose, route, and indication. The objective of this study was to evaluate the impact of a pharmacist led antibiotic time out process.

Methods:
This was an IRB-approved, retrospective, quasi-experimental chart review of patients admitted to Beaumont Hospital - Royal Oak campus, ages 18 years or older, initiated on antibiotics for 48 to 72-hours, on floors with staff clinical pharmacists. Study patients were identified from our electronic medical record system using existing and prospective data. Data collection points included: patient demographics (e.g., name, age, etc.), admission and discharge date, active treatment team, floor during antibiotic time-out tool utilization, clinical syndrome being treated, renal/hepatic function, antibiotic regimen, pharmacist intervention, total duration of antibiotics, cost of antibiotics, etc. All data was collected utilizing electronic medical records by a pharmacist using an Excel data collection form stored in SharePoint.

Results: Data is currently being analyzed. Results and conclusion will be presented at the conference.

Conclusions: Data is currently being analyzed. Results and conclusion will be presented at the conference.
Evaluation of the impact of a pharmacy delivered in-service on medical resident knowledge of appropriate insulin use.

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UAN: 0048-0000-18-124-L04-P

Learning Objectives:

1. Identify structure of pharmacy delivered in-services to medical residents in an ambulatory care clinic
2. Evaluate methods of delivering pharmacy provided education to medical residents

Purpose:
The American Diabetes Association (ADA) guidelines on treatment of type 2 diabetes provides recommendations on proper initiation and titration of insulin to achieve blood sugar control. The primary objective of this study is to evaluate the impact of a pharmacy delivered in-service about insulin use according to ADA guidelines on insulin knowledge of resident-physicians in an ambulatory care internal medicine clinic.

Methods:
This study will be submitted to the Institutional Review Board for approval. Thirty-six internal medicine resident-physicians will be invited to receive a 30-minute in-service on insulin and appropriate initiation and adjustment of these agents. Residents’ knowledge of insulin and its use will be assessed with a validated questionnaire which has been modified for best application in the clinic. This questionnaire will be administered one week prior to delivery of the in-service and re-administered 6 weeks after delivery of the in-service. Resident perception of the in-service will also be assessed using a satisfaction survey. A de-identified Microsoft Excel® spreadsheet will be used for data entry with coded numeric values assigned to participants to allow for pairing of pre- and post-scores. Comparison of individual performance on the pre- and post-test will be performed using a paired samples t test or Wilcoxon signed rank test if normality assumptions are unfulfilled. All tests will be two-sided with p

Results: Pending

Conclusions: Pending
Ascorbic Acid, Thiamine, and Hydrocortisone: Targeted Therapy for the Management of Septic Shock
Matthew Gatchel, PharmD, PGY1 Pharmacy Resident St. Elizabeth Youngstown Hospital
Dawn Miller, Pharm.D., BCPS, BCCCP, Clinical Pharmacy Specialist

UAN: 0048-0000-18-229-L04-P

Learning Objectives:

1. Explain the mechanistic evidence behind the use of Vitamin C in septic shock
2. Explain the mechanistic evidence behind the use of Vitamin C in septic shock

Purpose:
Sepsis accounts for 15/1000 hospital admissions in the United States. The incidence has continued to rise over the last decade. Sepsis is now defined as: “life-threatening organ dysfunction caused by a dysregulated host response to infection”. Mortality rates in patients with septic shock remain in excess of 40%. A recent study in CHEST demonstrated a statistically significant mortality benefit in septic shock patients who received a combination of ascorbic acid, thiamine, and hydrocortisone. In this study, patients with severe sepsis/septic shock and a procalcitonin $> 2 \text{ng/mL}$ were initiated on treatment protocol. They compared 47 control patients that were treated between June 2015 and December 2015 that met the same inclusion criteria. Mortality was 8.5% in the treatment group compared to 40.4% in the control group, $p$

Methods:
This is a retrospective chart review comparing septic shock patients from 11/2017–2/2018 receiving our protocol compared to a similar cohort treated from 11/2016–2/2017. Patients meeting the definition of septic shock with a serum lactate greater than 2 mmol/L were included for the study. This protocol includes: includes: vitamin C 1500mg IV Q6H x4days and thiamine 200mg IV Q12H x4days, and hydrocortisone at the discretion of the provider. Patients will be excluded if they are 24 hours after initiation of vasopressor agents.

Results: Data collection and analysis are in progress. Results and conclusions will be presented at the Ohio Pharmacy Residency Conference

Conclusions: Data collection and analysis are in progress. Results and conclusions will be presented at the Ohio Pharmacy Residency Conference
Capturing the Impact of Student Pharmacist’s on HCAHPS through Transition of Care Interventions

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Katie E. Stollar, PharmD; Lisa L. Forsyth, PharmD, FCCM; Janna Fett, PharmD, BCACP; Maureen A. Smythe, PharmD, FCCP

UAN: 0048-0000-18-125-L04-P

Learning Objectives:

3. Recognize integration of a student pharmacist is valuable to increase transitional care activities
4. Discuss opportunities to improve HCAHPS survey results

Purpose:
Limited information is currently published on student pharmacist’s impact in a dedicated transition of care role on Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scores. Our institution’s Department of Pharmacy recognized the need to increase the involvement of pharmacy in transitional care activities, including medication education to patients. To address this gap, a floor-based medicine APPE rotation with a focus on transitional care was created to allow the student to fully embrace the role of a pharmacist extender. The goal of this study is to capture the added value of a student pharmacist to the unit in regard to HCAHPS scores and quantification of meaningful transitional care interventions.

Methods:
This was a quasi-experimental study consisting of a retrospective baseline group as well as a prospective interventional group. The study was reviewed and approved by the institutional review board at our institution. Retrospective data was collected from January 1, 2017 through August 31, 2017; during this time, typical care was provided by unit-based pharmacist, but there was no consistent student pharmacist present. Prospective data was collected from October 1, 2017 through April 30, 2018; during this time, an APPE student pharmacist was implemented consistently on the unit and dedicated to transitions of care activities including preforming medication histories and medication educations. HCAHPS scores will be compared between baseline and interventional groups. Additionally, the students transitional care activities will be reported, including the number of patients who receive medication histories, and medication educations, and more specifically, the number of patients who had all new medications educated at discharge. Chi-square will be used for categorical data and descriptive statistics will be used for all other data.

Results: Results are pending and will be discussed at the Ohio Pharmacy Residency Conference

Conclusions: Conclusions to be discussed at the Ohio Pharmacy Residency Conference
Effectiveness of Multi-Modal Analgesia with Gabapentin and Methocarbamol in Critically Ill Trauma Patients

Domenico Grande, PharmD - Ascension St. John Hospital and Medical Center
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UAN: 0048-0000-18-126-L01-P

Learning Objectives:

1. Discuss the benefits of multi-modal analgesia
2. Describe the effects of gabapentin and methocarbamol on outcomes in critically ill trauma patients

Purpose:
Current guidelines recommend intravenous opioids for non-neuropathic pain in critically ill patients. However, these medications can cause sedation and respiratory depression which can impede recovery and increase ICU length of stay. Multi-modal analgesia with non-opioid analgesics is recommended to mitigate these adverse effects by reducing opiate consumption. The purpose of this study is to determine if gabapentin and methocarbamol reduce post-operative opioid consumption compared to standard therapy.

Methods:
This study is a single-center retrospective cohort analysis of adult trauma patients admitted to the surgical intensive care unit from January 2010 to January 2018. Patients receiving both gabapentin and methocarbamol in addition to standard therapy were matched according to Injury Severity Score and surgery type to patients receiving standard therapy alone. Patients were excluded if prescribed gabapentin, pregabalin, methocarbamol, or other skeletal muscle relaxants prior to admission; had less than 72 hours of gabapentin and methocarbamol therapy; received epidural during gabapentin and methocarbamol therapy; received more than 3 days of as needed methocarbamol prior to scheduled doses; or had a diagnosis of sickle cell disease. Cumulative doses (mg) of gabapentin and methocarbamol were collected for the first five days of multi-modal therapy, along with total opioid consumption in morphine equivalents. Secondary outcomes include post-operative pain scores, incidence of opioid-related adverse events, duration of mechanical ventilation, and ICU length of stay.

Results: To be presented at the Ohio Pharmacy Residency Conference.

Conclusions: To be presented at the Ohio Pharmacy Residency Conference.
Bleeding and thrombosis risk factors of apixaban versus warfarin in patients with renal dysfunction

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Elizabeth Petrovitch, PharmD., BCPS, Amy Morin PharmD, Denise Sutter-Long PharmD., BCPS, Raymond Yost, PharmD,

UAN: 0048-0000-18-127-L01-P

Learning Objectives:

1. Recognize patient factors impacting anticoagulation in patients with renal dysfunction
2. Discuss evidence for the use of apixaban in patients with CrCl < 25 mL/min

Purpose:
The use of apixaban in patients with impaired renal function has not been extensively studied. Large clinical trials evaluating apixaban in patients with atrial fibrillation and/or acute venous thromboembolism excluded patients with creatinine clearance less than 25 mL/min. Small pharmacokinetic/pharmacodynamic studies have reported limited data, but did not include efficacy and safety outcomes. Furthermore, patients with impaired renal function are at increased risk of bleeding without the presence of anticoagulation. This study will evaluate bleeding and thrombosis risk factors in patients on apixaban versus warfarin with creatinine clearance less than 25 mL/min.

Methods:
This is an Institutional Review Board approved retrospective study. It will be conducted at four tertiary academic medical centers. Chart review will be performed on all adult patients 18 to 89 years old who were admitted from January 1, 2014 through December 31, 2015. Patients will be included who were initiated on apixaban or warfarin for at least 45 days of treatment with a creatinine clearance less than 25 mL/min. The target sample size is 1,000 patients. Data will be collected to include comorbidities, past medical history, social history, indication for anticoagulation, concomitant medication, stroke and bleeding risk scores, renal function, bleeding events, thrombosis events, complete blood count, and coagulation blood testing. This data will be used to determine thrombosis and bleeding risk factors of apixaban versus warfarin. Patients will be identified through each site’s electronic medical record database, then de-identified data will be combined to create one database for analysis. The Chi-squared test will be used to evaluate all nominal data, student’s t test will be used to analyze continuous data, and log-rank test to analyze time-to-event.

Results: Analysis is currently being conducted; results and conclusions will be presented at the 2018 Ohio Pharmacy Conference.

Conclusions: N/A
The Implementation and Evaluation of Preconception-Focused, Community Pharmacist Provided Interventions

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Stacey M. Frede, PharmD, BCACP, CDE; Leah E. Fuller, PharmD, CDE; Pamela C. Heaton, BSPharm, PhD

UAN: 0048-0000-18-128-L04-P

Learning Objectives:

1. Define preconception care and discuss the potential for pharmacists to abide by guidelines developed by the Centers for Disease Control and Prevention (CDC) to deliver preconception care to a high-risk patient population.
2. Report the types of preconception care clinical interventions pharmacists may provide and the revenue generated from each.

Purpose:
Preconception care is a set of interventions aimed to identify and modify biomedical, social and behavioral risk factors that contribute to poor maternal and fetal health outcomes. Related services and their benefits are predominantly demonstrated in primary care settings. However, there is limited research displaying pharmacist provided preconception interventions and associated outcomes resulting from these services. The purpose of this study is to provide preconception care to improve the reproductive health of women of childbearing age and address CDC recommendations through the use of medication therapy management.

Methods:
Pharmacy staff at two sites of a grocery store chain pharmacy identified and enrolled patients 18-45 years of age who are covered by OutcomesMTM eligible prescription plans. Patients were excluded if they are pregnant, cannot become pregnant, or have cognitive impairment.

The pharmacist assessed profiles of all participants to determine which objective-based interventions to perform for that patient. Interventions provided include: 1) assessing and modifying adherence while improving access to contraception 2) providing patient education and direct-patient services for preconception care measures (folic acid use, prescription and over-the-counter high risk pregnancy medications, immunizations, family planning referral, and providing free pregnancy tests) and 3) performing comprehensive medication reviews and managing chronic disease states. After choosing the appropriate course of action, the pharmacist provided, documented and submitted the intervention for reimbursement utilizing the OutcomesMTM platform.

Data were analyzed via descriptive statistics to determine the percentage of successfully billed claims, approved therapy modifications initiated by the pharmacy, and the number of referrals made. Successful claims are defined by the potential for reimbursement for services provided.

Results: This study is still ongoing; therefore, final results have not been obtained.

Conclusions: It is hypothesized that pharmacists providing preconception care interventions will result in an increase in appropriate therapy modifications and referrals and generate additional revenue for the pharmacy.
Restructuring the scope, documentation, and payment of medication therapy management (MTM)

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UAN: 0048-0000-18-129-L04-P

Learning Objectives:

1. Describe the value of pharmacist lead MTM services
2. Review targeted interventions

Purpose:
Studies like The Asheville Project reported improved patient outcomes of chronic disease states in greater than fifty percent of patients and direct health cost savings of an average of fifteen hundred dollars per patient per year as a result of pharmacist consultation. There is a current need to develop a MTM practice model that is financially sustainable for both health plan payers and clinically based pharmacist intervention employers. The purpose of this study is to restructure one of the current, commercially available, web-based MTM systems to improve quality of patient care, allow pharmacists to better utilize targeted interventions, and demonstrate clinically based pharmacist revenue.

Methods:
This study will be conducted in a series of four phases: Model Structure, Financial Analysis, Implementation, and Results Analysis. The first phase, Model Structure, will revise existing and define new targeted interventions and the required documentation for each activity. During the Financial Analysis phase, a return on investment will be performed in order to predict financial efficiency. Medication therapy management targeted interventions will be conducted by pharmacists and pharmacy residents during the Implementation phase. Lastly, in the Results Analysis phase, a retrospective review of financial and health outcomes will be completed to validate worth of restructuring the current MTM practice model.

Results: In progress.

Conclusions: In progress.
**Concomitant use of oral anticoagulants with aspirin in elderly atrial fibrillation patients**

Emma C Hatfield*, PharmD, St. Elizabeth Healthcare  
Deanna J Ratermann, PharmD, BCPS Lee H Bilz, PharmD

**UAN:** 0048-0000-18-130-L01-P

**Learning Objectives:**

2. Discuss the importance of appropriately dosing oral anticoagulants and aspirin in the elderly population.

**Purpose:**
Determine the incidence of bleeding events in patients ≥75 years old (elderly) and < 75 years old discharged on both an oral anticoagulant (OAC) and aspirin (ASA). The secondary outcomes of the study are to determine if missed dose adjustments of direct oral anticoagulants (DOAC) is a risk factor for a major bleeding event and to assess rates of ASA prescribing for primary vs. secondary prevention.

**Methods:**
Retrospective review of patients ≥18 years old admitted with a bleeding event on OAC and ASA from January 1, 2017 to June 30, 2017. The electronic medical record was utilized to generate a report of patients discharged during this time on both an OAC and ASA. A second report was generated with a list of patients readmitted with a bleeding event. Data was collected for patients readmitted with a bleeding event.

**Results:** Of 1276 patients discharged with both an OAC and ASA, 193 had a bleeding event (16.586% of elderly patients, 13.74% of non-elderly patients, p=0.18). Of those receiving a DOAC, elderly patients were less likely to be dosed appropriately (52.174% vs 77.778%, p=0.031). There was not a significant difference in major bleeding for those dosed appropriately vs inappropriately (67.5% vs. 58.525%, p=0.603). Overall, 36.78% of those with a bleeding event received ASA for secondary prevention. Elderly patients were less likely to have ASA for primary prevention when compared to the non-elderly (56.311% vs. 71.111%, p=0.048).

**Conclusions:** Elderly patients were more likely to be readmitted to the hospital with a bleeding event, receive inappropriate DOAC dosing and receive ASA for primary prevention. However, the elderly population is also more likely to have other comorbidities that could account for the increase in bleeding events. Appropriate dosing of OACs may reduce the incidence of bleeding events in the elderly population.
Adherence to the Diabetic Ketoacidosis Order Set and Association with Patient Outcomes

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UAN: 0048-0000-18-131-L01-P

Learning Objectives:

1. Review the appropriate treatment of hyperglycemic crisis as outlined by the American Diabetes Association.
2. Identify common difficulties in adhering to a diabetic ketoacidosis protocol

Purpose:
Diabetic ketoacidosis (DKA) is a medical emergency that can lead to serious adverse events and death if left untreated. Many institutions have implemented standardized procedures based on the American Diabetes Association guidelines, however treatment is multifaceted. While protocols have been shown to be effective in DKA management, several institutions have reported difficulty in adhering to treatment algorithms due to confusion and time constraints. The purpose of this study was to evaluate adherence to the DKA order set at Mercy Health St. Vincent Medical Center and assess safety outcomes associated with its use.

Methods:
This was a retrospective chart review including adult, nonpregnant patients between March 1st and August 31st, 2017 with hyperglycemic crisis managed with the DKA order set. Timing of blood glucose measurements, insulin infusion titrations, and time-to-transition of dextrose-containing fluid and subcutaneous insulin was assessed for accuracy. The primary endpoint was percent of nonadherence-to-protocol events in this patient population. A subgroup analysis was conducted to compare adherence rates, resolution of hyperglycemic crisis, and length of stay in patients with prolonged length of stays in the emergency department.

Results: Among the seventy-eight patients included, the percentage of nonadherence-to-protocol events was 30.2%. The demographics of the population included a mean age of 39.7 years, weight of 79.3 kg, initial anion gap of 27.0 mEq/L, initial glucose of 665.9 mg/dL, and 57.7% were male. In terms of evaluating the safety of the protocol, 30.8% of patients experienced hypokalemia, 6.4% of patients experienced hypoglycemia, and no patients experienced severe hypoglycemia (glucose

Conclusions: DKA management is complex and nonadherence-to-protocol events occurred nearly one-third of the time. Additional conclusions will be presented at the conference.
Evaluation of Vaccination Coverage and Infections in Patients Undergoing Splenectomy Due to Trauma

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Nina Naeger Murphy, PharmD, BCPS AQ-ID; Nilam Patel PharmD, BCPS

UAN: 0048-0000-18-132-L04-P

Learning Objectives:

1. Discuss current literature regarding vaccination coverage in asplenic patients.
2. Describe barriers identified in providing patients, undergoing emergent splenectomy due to trauma, with appropriate vaccination coverage.

Purpose:
The primary objective of this study was to determine the number (%) of patients who received a complete vaccination series against Streptococcus pneumoniae, Haemophilus influenzae type b, and Neisseria meningitides after splenectomy due to trauma. Secondary objectives included the number (%) of patients who received appropriate vaccinations against encapsulated organisms prior to discharge from splenectomy and the number (%) of patients who developed infections with encapsulated organisms within one year after splenectomy due to trauma.

Methods:
This was a retrospective, descriptive chart review of adult patients who underwent emergent splenectomy due to trauma at MetroHealth Medical Center between January 1, 2012 and March 31, 2017. The hospital’s trauma registry was be used to identify patients. Inclusion criteria were 18 years of age or older and emergent splenectomy due to trauma. Patients with elective splenectomy, contraindications to vaccinations, active encapsulated bacterial infection at the time of splenectomy, or pregnancy were excluded from the study. Data was collected and reviewed by a pharmacist for appropriateness. Descriptive statistics were used to analyze all results.

Results: Seventy-two patients underwent emergent splenectomy due to trauma. Ten patients died during hospital admission. Only 1.6% (n= 1/62) received a complete vaccination series after splenectomy. 12.9% (n=8/62) received appropriate vaccinations prior to discharge. At discharge, 77.42% (n=48/62) of patients had a follow-up appointment scheduled and 77.1% (37/48) followed up. Of those, 12.9% (n=8/62) received additional vaccinations. A total of 2 patients developed an encapsulated organism infection with-in one year of splenectomy.

Conclusions: Preliminary data suggests that patients undergoing emergent splenectomy due to trauma are under-vaccinated, increasing one’s risk of developing a life threatening infection.
Evaluation of Antibiotic De-escalation Based on Culture Susceptibilities in an Academic Medical Center: A Retrospective Review

Colton Hill, PharmD
Thomas Bonsall, PharmD, BCPS

UAN: 0048-0000-18-133-L01-P

Learning Objectives:

1. Explain the utility of a susceptibility panel
2. Identify methods to optimize a susceptibility panel display

Purpose:
Inappropriate de-escalation of antibiotic therapy leads to antimicrobial resistance, higher cost, as well as sub-optimal treatment. Proper de-escalation can depend in part on the display of an effective susceptibility panel. Improper de-escalation of antibiotics was identified as an ongoing trend. This project was designed to evaluate the de-escalation practices before a pharmacist led modification of a susceptibility panel and compare that to post-modification de-escalation patterns.

Methods:
Data on pan-sensitive, Escherichia coli urinary tract infections (UTIs) was collected pre-modification of the susceptibility panel display. Each case was evaluated and ranked whether there was complete de-escalation to the most appropriate narrow spectrum antibiotic, partial de-escalation to an antibiotic that is not the most appropriate narrow spectrum choice, or no de-escalation. This same process then occurred for UTIs post panel modification. Results were then compared to evaluate the effects of the pharmacist led panel modification. All results were de-identified to maintain patient confidentiality. Also, rate of same antibiotic class/generation interchanges was recorded pre and post-modification to determine if this was also impacted. In addition, time to de-escalation was also collected and analyzed.

Results: Prior to panel modification, a majority of the time (41.7%) there was no de-escalation on antibiotic therapy. Partial de-escalation occurred 30.6% of the time, and compete de-escalation only occurred in 11% of cases. In addition, 16.7% of therapy resulted in an unnecessary escalation of therapy. This data will be compared to that of post modification.

Conclusions: Before modification of a susceptibility panel of pan-sensitive Escherichia coli, complete de-escalation only occurred 11% of the time. This may be drastically increased by the intervention of a pharmacist to the sensitivity panel and will be determined and presented at the 2018 Ohio Pharmacy Residency Conference.
Training, Implementation and Evaluation of SBIRT in a Community Pharmacy

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Anne Metzger, PharmD, BCPS, BCACP; Karissa Kim, PharmD, BCPS

UAN: 0048-0000-18-134-L04-P

Learning Objectives:

1. Describe the history of SBIRT use in clinical practice.
2. Compare barriers to implementing SBIRT in the outpatient healthcare setting to the community pharmacy.
3. Develop one potential way to implement SBIRT into a pharmacy practice setting.

Purpose:
The purpose of this study is to determine the implementation of screening, brief intervention, referral to treatment (SBIRT) in a community pharmacy. The study objective is to assess pharmacy employees’ knowledge of SBIRT before and after completing online training and evaluate the implementation process of SBIRT into community pharmacy workflow.

Methods:
In this two-phase study, participants completed online training and a pre- and post-test of SBIRT knowledge. In the second phase, participants took part in a focus group to determine standard operating procedures, which was then implemented for one month. A second focus group evaluated the implementation process and barriers. To analyze survey results, participants answers to the pre-test were compared to the post-test to evaluate change in knowledge. The focus group data was analyzed, and implementation documented on a process flow diagram. The number of patients who screen positive and the number of patients referred or requiring brief intervention will be tracked.

Results: There are 4 participants in the study which includes pharmacists and pharmacy technicians. The mean score of the pre-test was 74 (2.5) and the post-test was 70 (7.07). The initial focus group determined the standard operating procedures as follows: patients are screened with two questions at pick-up window, patient self-administers AUDIT or DAST if initial screen is positive and results are reviewed by a pharmacist. The pharmacist will either provide brief intervention or referral to behavioral health, as appropriate. The second focus group discussed the process and barriers to implementation.

Conclusions: The number of participants was too small to draw conclusions on the effectiveness of SBIRT training. There were many barriers to the implementation of SBIRT in a community pharmacy. This study demonstrates one potential process of implementing SBIRT in a community pharmacy setting.
Evaluation of impact of pharmaceutical sales representative visits on prescribing patterns within a teaching hospital.

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Colleen Harrell, PharmD, CDE, CACP

UAN: 0048-0000-18-135-L04-P

Learning Objectives:

1. Describe the relationship between pharmaceutical sales representative (PSR) visits and prescribing patterns.
2. Discuss the impact of policies limiting PSR detailing.

Purpose:
The pharmaceutical industry spends $27 billion each year on promotion and $24 billion of that is spent on physician targeted marketing specifically. Studies have shown that visits from PSRs are associated with a lower quality and higher costs of prescribing, including less guideline adherence. At ProMedica Toledo Hospital (PTH) and ProMedica Toledo Children’s Hospital (PTCH), employees are prohibited from requesting or accepting gifts of any value from PSRs (with the exception of educational materials and food). However, PSR visits influence on prescribing patterns occur even when gifts are limited to meals and educational gifts. The purpose of this study is to determine the short term impact of pharmaceutical sales representative (PSR) visits on medication ordering patterns at ProMedica Toledo Hospital.

Methods:
This study is a retrospective study, examining any changes in ordering patterns before and after PSR visits to ProMedica Toledo Hospital. Inclusion criteria include drugs with a sales representative visit from January 1, 2017 – August 31, 2017 at ProMedica Toledo Hospital. Order data will be collected for included drugs for a baseline period and for each of the four weeks following a PSR visit. Data will be collected from VendorMate, a sales representative logging database, and our electronic medical record.

Results: To be presented at the Ohio Pharmacy Residency Conference.

Conclusions: To be presented at the Ohio Pharmacy Residency Conference.
Using Adjusted Body Weight vs. Total Body Weight for Empiric Vancomycin Dosing in Obese Patients

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Michael A. Rudoni, PharmD, BCPS, BCCCP; Sean McGonigle, PharmD, BCPS

UAN: 0048-0000-18-136-L01-P

Learning Objectives:

1. Describe the differences in vancomycin pharmacokinetics between obese and non-obese patients.
2. Discuss the evidence supporting adjusted body weight-based empiric vancomycin dosing in obese patients.

Purpose:
In 2009, the American Society of Health-System Pharmacists, the Infectious Diseases Society of America, and the Society of Infectious Diseases Pharmacists issued a consensus statement recommending initial vancomycin doses of 15 to 20 milligrams per kilogram calculated using total body weight (TBW). However, a correlation between increasing body mass index and supratherapeutic vancomycin troughs has been reported, which questions whether TBW should be used in the obese population. Pharmacokinetic data suggest that using adjusted body weight (AdjBW) may be able to attain therapeutic concentrations in patients who are overweight and limit unnecessary drug exposure. This study was conducted to identify the rate of achieving therapeutic trough concentrations and the incidence of nephrotoxicity with weight-based dosing of vancomycin using AdjBW compared to TBW.

Methods:
A pre- and post-intervention study was conducted at a large, tertiary care medical center comparing two vancomycin dosing strategies. A three-month pilot from November 2017 through January 2018 was implemented in which pharmacists dosed vancomycin using AdjBW in obese adults (defined as TBW > 130% ideal body weight). Trough concentrations and incidence of nephrotoxicity during the pilot were compared to historical data (November 2016 through January 2017) when TBW was used for all patients. Patients with impaired renal function requiring vancomycin dosing by level or hemodialysis, known pregnancy, an AdjBW > 100 kg, missed doses of vancomycin prior to the initial trough, or vancomycin extravasation prior to the initial trough were excluded.

Results: To be presented at the 2018 Ohio Pharmacy Resident Conference.

Conclusions: To be presented at the 2018 Ohio Pharmacy Resident Conference.
Personalized antimicrobial stewardship in the management of hospitalized patients with pneumonia

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Kellie Buschor, PharmD, BCPS, BCCCP; Kelli Cole, PharmD, BCPS; Fadi Safi, MD

UAN: 0048-0000-18-137-L01-P

Learning Objectives:

1. Discuss the impact antimicrobial stewardship interventions in hospitalized patients with pneumonia
2. Describe the use of the Spectrum Score in assessing antimicrobial de-escalation

Purpose:
Antimicrobial stewardship (AS) has been shown to improve antimicrobial use, however barriers still exist in optimizing management of patients with pneumonia. One strategy to improve guideline adherence and de-escalation is to enhance AS through personalized, consensus-building strategies. At our institution, patients with pneumonia are largely managed by pulmonary intensivists on either the medical intensive care unit (MICU) or pulmonary services but served by a dedicated rounding pharmacist (DRP) only in the MICU. The purpose of this study is to identify if AS intervention via a DRP improves management of hospitalized patients with pneumonia.

Methods:
IRB-approved, single-center retrospective cohort including all patients admitted to the pulmonary or MICU service with pneumonia and received &gt; 48 hours of antimicrobials between July 1, 2012 - June 30, 2017. Patients excluded were: completing a previous course of antimicrobials, immunosuppressed, or had a pre-existing lung condition. Primary outcome: rate of antimicrobial de-escalation at day 4. Secondary outcomes: duration of therapy, clinical success and rate of re-escalation, hospital and ICU lengths-of-stay (LOS), 30-day readmission, Clostridium difficile infection, and in-hospital and 30-day all-cause mortality.

Results: 1,551 patient encounters screened, 24 were included (pulmonary service = 19, MICU = 5). Baseline characteristics were similar between groups with 62.5% male and a median age of 68.5 years. Rate of de-escalation at day 4 was not different between MICU and pulmonary services (60% vs. 57.9%, $p = 1.00$). There was also no difference in secondary outcomes except hospital LOS (14 days vs. 5.4 days, $p = 0.002$).

Conclusions: Upon preliminary analysis, presence of a DRP did not significantly impact the rate of antimicrobial de-escalation in hospitalized patients with pneumonia. However, the observed rate of de-escalation was higher than expected based on current literature which may affect our findings. Further data collection and analysis will be performed and presented at OPRC.
Impact of implementing a sports-focused supplement section on pharmacist-patient relationships and sales in a community pharmacy: Phase II

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Kristen DiDonato, PharmD, BCACP; Daniel Janovick, PharmD, CISSN; Michelle Schroeder, PharmD, BCACP, CDE; Mary Powers, PhD, RPh; Andrew Azzi, PharmD; Aaron Lengel, PharmD, BCACP

UAN: 0048-0000-18-138-L04-P

Learning Objectives:

1. Describe pharmacist education provided and its impact on product movement and patient engagement pre- and post-implementation
2. Evaluate the impact of providing sports supplement counseling in a community pharmacy

Purpose:
With a greater emphasis from national health organizations on the pharmacist’s role in preventative health, one area where pharmacists could expand their services includes education on supplement use for patients engaged in various levels of physical activity. There is little documented evidence of sports-focused pharmacy programs in a community setting or sports medicine education in pharmacy program curricula.

The objectives of this study are to evaluate the impact of sport supplement training for pharmacists and the implementation of a sports-focused supplement section in the pharmacy OTC aisles on: (1) the number and quality of pharmacist-patient interactions and (2) supplement sales and product shelf movement.

Methods:
Results from Phase I showed that counseling on sports-related supplements may be a viable way to expand pharmacy services. Patients did not initially view pharmacists as a resource for education on supplements but would be willing to utilize pharmacists if they appeared knowledgeable on the topic. Pharmacists were interested in providing counseling to patients on this topic but felt they required additional training.

In Phase II, a sports supplement section will be designed using products currently available at the supermarket. Products desired by patients, based on Phase I survey results, will be separated/marketed to engage patients. To prepare pharmacists to counsel patients, they will complete continuing education on sports supplements for additional knowledge on this topic. Patients who receive counseling will be asked to complete a satisfaction survey about the newly implemented service from pharmacists. Pharmacists will use 5-point Likert scales to rank their knowledge and confidence levels in providing education. Supplement sales, number of products moved, and number of pharmacists’ interactions will be evaluated five months before section implementation and five months post-intervention. Descriptive and non-parametric statistical analyses will be performed using SPSS. This study was approved by the University of Toledo Institutional Review Board in February 2017.

Results: After providing education to pharmacists, 2 out of the 14 pharmacists it was presented to watched the videos and completed the continuing education quiz. Prior to this only one interaction had been documented with zero interactions documented afterward. The informational handouts about sports nutrition were taken off of the shelf, but unknown quantity was taken. Over the course of 5 months when the supplement section was set up, 15 products had moved total between 3 different
stores. The most popular being pre-workout supplements which was similar to one store’s movement prior to implementation. Creatine and protein supplements had no movement from the shelves similar to one store who had minimal movement of those products prior to implementation.

**Conclusions:** While pharmacists did not feel like they had enough knowledge and confidence to provide sports supplement counseling, they did recognize it would be beneficial. However, when presented with the opportunity, pharmacists did not fully engage. Therefore, sports supplement counseling is not a viable and sustainable service to expand as a standard across all community pharmacies. Future studies warrant the need to explore pharmacists’ commitment to health and wellness to identify their passions to maximize engagement, change their own wellness habits, and attract potential patients of the health conscious population.
Comparison of pharmacist-managed anticoagulation service models in patients with continuous-flow ventricular assist devices

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UAN: 0048-0000-18-139-L01-P

Learning Objectives:

1. Describe the differences between face to face and patient self testing anticoagulation service models.
2. Review the potential impact of each service model on efficacy, safety, and efficiency measures.

Purpose:
The use of continuous-flow ventricular assist devices (VAD), an effective mechanical circulatory support option for patients with end stage heart failure, is expected to exponentially grow with the increasing prevalence of cardiovascular diseases. VAD recipients are at high risk for both bleeding and thrombotic events, the latter of which requires chronic antithrombotic therapy with warfarin. Frequent monitoring of the International Normalized Ratio (INR) is necessary to minimize these risks. There is limited data regarding the optimal anticoagulation management strategy in this patient population. Various anticoagulation service models exist, including face-to-face clinic appointments with point of care testing (POCT), and telephone management of patient self-testing (PST) results from a home monitor. This study aims to compare and evaluate the effectiveness, safety, and efficiency of two pharmacist-managed anticoagulation service models in patients with continuous-flow ventricular assist devices.

Methods:
In this retrospective chart review, VAD recipients who received care from a pharmacist through Anticoagulation Management Services over a 6 month period were considered for inclusion. Patients enrolled in the pilot home monitoring PST program were compared with patients who received anticoagulation management via face-to-face clinic appointments. The primary objective is to compare time in therapeutic range (TTR) (calculated via Rosendaal method) between groups and will be analyzed using a Rank Sum test. Secondary objectives include the difference in the incidence of major bleeding events, thrombotic events, and hospitalizations and will be analyzed using a chi-square or Fischer’s Exact test. The time required to conduct phone management and type of additional pharmacist interventions will also be reported.

Results: Thirty-six patients were eligible for inclusion, 17 in the PST program and 19 in the face-to-fact program. Data collection is in progress.

Conclusions: Conclusions will be presented at the Ohio Pharmacy Resident Conference.
A retrospective, matched cohort study comparing the incidence of nephrotoxicity between two dosing regimens of piperacillin/tazobactam

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UAN: 0048-0000-18-140-L01-P

Learning Objectives:
1. Review the incidence of nephrotoxicity when using piperacillin/tazobactam
2. Discuss the rate of piperacillin/tazobactam induced acute kidney injury

Purpose:
Piperacillin/tazobactam (PTZ) is a combination semi-synthetic penicillin/β lactamase inhibitor with a broad spectrum of activity, including coverage of Pseudomonas aeruginosa and anaerobic bacteria. Recent literature has suggested a higher risk of nephrotoxicity when PTZ is combined with vancomycin than if either agent is used as monotherapy (Rutter 2017 and Giuliano 2016). The risk of nephrotoxicity with vancomycin is well documented. However, PTZ has not historically been associated with a risk of nephrotoxicity. A phase 3 clinical trial with PTZ reported a serum creatinine (sCr) increase of

Methods:
This was a retrospective, matched cohort study that was approved by the institutional review board. This study examined patients who were admitted to Cleveland Clinic Hillcrest Hospital or Cleveland Clinic Fairview Hospital between January 1, 2017 and December 31, 2017. The two dosing regimens of PTZ are based on renal adjustments for an estimated creatinine clearance (CrCl) between 20-40 mL/min. The first regimen decreases the dose of PTZ from 3.375 g q6h to 2.25 g q6h for this range of CrCl (total daily dose = 9 g). The second regimen decreases the frequency of administration from 3.375 g q6h to 3.375 g q8h for this range of CrCl (total daily dose = 10.125 g). Patients were included if they were: ≥ 18 years old, CrCl 20-40 mL/min, received PTZ for more than 72 hours, and received less than 24 hours of concomitant nephrotoxic medications. Patient were excluded if they were: pregnant, receiving hemodialysis or continuous peritoneal dialysis on admission or receiving extended or continuous infusion PTZ. Cohorts were matched based on age, sex, duration of PTZ use, baseline CrCl, ICU admission, and comorbidities. Acute kidney injury was defined based on the RIFLE criteria and CrCl was calculated based on the Cockcroft-Gault equation. Data collection included: demographics, baseline sCr, highest sCr, concomitant antibiotics, concomitant nephrotoxic medications, use of fluids, comorbidities (diabetes mellitus, hypertension, hypotension, heart failure, and cancer), ICU admission, and total days of therapy. The primary outcome was the difference in incidence of acute kidney injury between the two cohorts. Secondary outcomes that were measured include: overall incidence of PTZ nephrotoxicity, mortality at 30 days, hospital length of stay, 30-day readmission for same or related infection, and progression to hemodialysis.

Results: Data collection and analysis are in progress.

Conclusions: Results and conclusion will be presented at the Ohio Pharmacy Resident Conference.
Quality Initiative Review on Statin Adherence at 90 Days Post-Discharge in ST-Segment Elevation Myocardial Infarction (STEMI) and Non-ST-Segment Elevation Myocardial Infarction (NSTEMI) Patients

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UAN: 0048-0000-18-141-L04-P

Learning Objectives:

1. Review the current statistics on medication adherence and importance of pharmacy involvement in Meds-to-Beds program
2. Discuss the American College of Cardiology (ACC) National Cardiovascular Data Registry (NCDR) (ACTION) and methodology of the study
3. Outline the follow-up counseling calls to patients discharged post STEMI/NSTEMI
4. Review the importance of pharmacy involvement in medication adherence and the impact pharmacists can have in the transition of care process

Purpose:
Barriers to medication adherence for patients continue to be an issue throughout the healthcare setting. In a 2017 systematic review and meta-analysis evaluating adherence and persistence among statin users aged 65 and older, 48.2% were non-adherent within the first year and 23.9% discontinued altogether within the first year.1A part of the Centers for Medicare and Medicaid Services (CMS) evaluates medication adherence using the Proportion of Days Covered (PDC) calculation. The PDC calculation assesses patient adherence based on the number of days that the patient was in possession of all of their medication(s). This in turn impacts the pharmacies Star Ratings and reimbursement rates established by Medicare. One way to increase adherence is via the Meds-to-Beds program. Pharmacists play a vital role in the importance of medication adherence, when providing medications and education at hospital discharge via a Meds-to-Beds program, which has shown a (?) in medication adherence at 30 days post-discharge. As UHSJMC is working on the development of a Meds-to-Beds program, adherence past 30 days post-discharge would like to be evaluated. The primary objective is to determine if STEMI and NSTEMI patients are adherent to their statin therapy after 90 days post discharge. For those patients that are non-adherent at 90 days post-discharge, the following causes of non-adherence will be collected and reviewed: side effects, cost, logistics of picking up/receiving the medication, days supply of the prescription and any other barriers affecting medication adherence

Methods:
A retrospective review of all NSTEMI and STEMI patients included in the American College of Cardiology (ACC) National Cardiovascular Data Registry (NCDR) ACTION registry discharged from UHSJMC with a prescription for a statin was collected. Data to be utilized for this review will be from January 2017 through December 2017. Patients will be called via telephone at minimum post 90 days and asked if they are still taking their prescribed statin, the days supply that they were given at discharge, which physician they saw post-discharge and the area of specialty for this physician, if changes were made to their statin regimen, the date of the follow up appointment post discharge, if their insurance requires them to fill their prescription using a mail order pharmacy and if they had been readmitted to the hospital. If the patients did discontinue statin therapy without a prescribers consent, a subset of questions will be asked including if cost, side effects, ease of filling/ picking up the prescription and any other reasons the patient may not be taking their statin as indicated.

Results: Pending

Conclusions: Pending
Impact of a Collaborative Diabetes Management Service on Diabetes in an Underserved Population: A Pilot Study

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UAN: 0048-0000-18-142-L04-P

Learning Objectives:

1. Define Ohio’s consult agreement laws as they relate to pharmacy practice.
2. Given a sample protocol, identify one potential area to develop collaborative practice agreements in a pharmacy practice setting.
3. Discuss the impact of a pharmacist-involved collaborative practice agreement in a federally qualified health center (FQHC) using data from a retrospective chart review.

Purpose:
Diabetes affects approximately 12.2 percent of U.S. adults. Patients diagnosed with diabetes can accrue healthcare costs that are 2.3 times higher than those for patients without diabetes. Effective management of the disease can reduce healthcare costs, prevent disease-related complications, and improve patients’ quality of life. Collaboration with pharmacists for chronic disease state management has shown positive impacts on patient outcomes. This retrospective review evaluated the impact of pharmacist-led interventions via a collaborative practice agreement (CPA) on glycemic control in patients at a federally qualified health center (FQHC).

Methods:
De-identified records were queried for patients with diabetes seen by any provider at Elm Street Health Center for diabetes management in 2017. Average baseline and final hemoglobin A1c (HbA1C) values were calculated for patients treated by their primary care provider (PCP) collaborating with a pharmacist (group 1) compared to patients treated by their PCP alone (group 2) and analyzed using independent samples t-test.

Results: Group 1 had an average baseline HbA1C of 7.95% +/- 1.80 and a final average HbA1C of 7.67% +/- 1.63. Group 2 had an average baseline HbA1C of 7.77% +/- 2.13 and a final average HbA1C of 7.52% +/- 1.97. Differences in change in HbA1C between the two groups were not statistically significant (P=0.5397). Both groups experienced an increased number of patients with HbA1C 9%; group 1 experienced an increase in patients with HbA1C between 7% and 9%, while group 2 exhibited a decrease.

Conclusions: Preliminary data shows no significant difference in change in HbA1c value between patients seen under the CPA compared to those receiving usual care. This suggests that pharmacists engaged in a collaborative disease state management program utilizing a CPA are just as effective in managing patients with diabetes as usual care alone.
The impact of smoking cessation education on long-term care pharmacy employees’ willingness to quit

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UAN: 0048-0000-18-143-L04-P

Learning Objectives:
1. Recognize the prevalence of smoking in the United States
2. Identify potential barriers in an individual’s smoking cessation process
3. Discuss the results of smoking cessation studies conducted and identify potential roles for pharmacists’ in aiding smoking cessation

Purpose:
To determine tobacco use rates among employees of long-term care pharmacies and utilization of smoking cessation education materials.

To provide participants with education on the health risks of smoking, benefits of quitting, and approaches to successful cessation.

To assess the impact of education on participants willingness to quit smoking.

Rationale: Smoking continues to be a concern in the United States. A 2015 CDC survey found 141 million of the 223 million adults surveyed identified as currently employed and a smoker. Studies show the first step to quit smoking, is motivation; the second, maintaining motivation. Among other studies, smokers noted a lack of education and finances as hindering factors.

Methods:
The question remains: does smoking cessation education increase a person’s willingness to quit? To answer this question, an initial survey from Survey Monkey will be distributed via email to employees of 6 long-term care pharmacy locations, in which they identify as either a smoker or non-smoker. The minimum number of participants desired is 100. Participants will be identified via a participant generated identifier to maintain confidentiality. For smokers, additional questions will assess their knowledge, habits, and willingness to quit. Following the survey, emails containing a short video on a smoking-related topic, will be sent weekly to all employees for 6 weeks. An additional email containing a link to access further information regarding the current week’s smoking cessation topic will be sent. Topics include components of a cigarette, health risks of smoking, benefits of quitting, costs, and methods to quit. After the 6-week education phase, a final survey will be emailed to assess for changes in willingness to quit. Information will be collected via password-protected Excel spreadsheet and analyzed. Statistics will be analyzed through rANOVA and Shapiro-Wilk test. The study was submitted for approval by the University of Toledo Social, Behavioral & Educational Institutional Review Board.

Results: Research is in progress and results are pending.

Preliminary Results:
- A total of 35 participants were enrolled in the study; 27 nonsmokers, never smoked; 6 non-smokers, previously smoked; 2 current smokers. The two current smokers reported a willingness to quit of 5 or less.
- Of the current smokers and previous smokers, a total of 5 participants reported making attempts to quit; 3 made attempts to quit cold turkey.
• Among the 35 participants enrolled, only 8 patients reported receiving education on smoking cessation, 5 of which were non-smokers, never smoked.

Conclusions: Preliminary data from the small subset of long-term care employees showed significance of health correlated to increased age and increased smoking behaviors. Surveys showed that with current smokers, previous smokers and non-smokers, there was a lack of education provided. These populations could benefit from smoking cessation education to impact their willingness to quit.
Assessment of insulin regular versus insulin lispro for use as sliding scale insulin and the incidence of hypoglycemia

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UAN: 0048-0000-18-144-L01-P

Learning Objectives:

1. Describe why sliding scale insulin does not provide optimal blood glucose control for patients with diabetes that are admitted to the hospital
2. Determine which insulin type leads to greater instances of hypoglycemia

Purpose:
The use of sliding scale insulin as a method for blood glucose management in the inpatient setting is controversial. This therapy is believed to lead to suboptimal treatment and increased safety risks. The objective of this study is to identify the number of patients who experience a hypoglycemic event when treated with sliding scale insulin lispro in comparison to sliding scale insulin regular.

Methods:
A retrospective review of electronic medical records will identify patients treated with sliding scale insulin regular and lispro. The inclusion criteria for the study require patients to have a diagnosis of diabetes and be in either an ICU step-down or general medicine unit. The patients must be ordered sliding scale insulin (2:50 ratio starting at 150 mg/dL) and have documentation of receiving a dose. The qualifying patient profiles will be reviewed for instances of hypoglycemia as the primary endpoint. In addition to identifying the number of patients who experience hypoglycemic events, this study will also examine the time of day that hypoglycemic events occur and the length of hospital stay. The data from the patients treated with sliding scale insulin regular and lispro will be compared to identify if instances of hypoglycemia differ between these types of insulin.

Results: Data collection and statistical analysis is ongoing. Final results will be available at the Ohio Pharmacy Residency Conference

Conclusions: Our hypothesis is that sliding scale insulin lispro will have less instances of hypoglycemia. The goal is to provide evidence for using one type of sliding scale insulin in the hospital.
The diuretic efficacy of bumetanide versus furosemide intravenous bolus dosing in patients with acute decompensated heart failure and hypoalbuminemia

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UAN: 0048-0000-18-145-L01-P

Learning Objectives:

1. Review therapy recommendations for treatment of acute decompensate heart failure
2. Describe the pharmacokinetic parameters of commonly used loop diuretics and the role of albumin

Purpose:
Intravenous (IV) loop diuretics (LDs) are the mainstay of therapy in patients hospitalized with acute decompensated heart failure (ADHF). Hypoalbuminemia is present in about 20% of all hospital admits, also seen in patients with ADHF. LDs are highly albumin bound, and adequate serum albumin levels are necessary in order for LDs to exert effective diuresis. The purpose of this study was to evaluate if there is a difference in dose-response effect between intermittent IV furosemide (FUR) and bumetanide (BUM) in patients with ADHF and hypoalbuminemia.

Methods:
This single-center, retrospective cohort study included patients admitted for ADHF, who received at least 24 hours of FUR or BUM, with hypoalbuminemia (≤3.3 g/dL). Patients were excluded if urine output (UOP) was not recorded, or if they received concurrent thiazides, renal replacement therapy, or albumin products. The primary outcome was the dose-response effect of LDs in 24 hours, measured as UOP in milliliters per milligram (mL/mg) of FUR equivalents.

Results: Of 102 patients identified (65% male, left ventricular ejection fraction 41±15%, serum creatinine 1.53±0.66 mg/dL), 52 patients received FUR, and 50 received BUM. Patients in the BUM group had UOP of 1011±33 mL/mg of drug received, and 33±25 mL/mg in the FUR group, yielding a dose-equipotency ratio of 30:1 for FUR to BUM. After accounting for equipotency, primary outcome was analyzed using the Wilcox Rank-Sum test. There was no difference in 24-hour UOP between BUM and FUR groups, UOP 20 [13.5-30.0] mL/mg, and 20 [13.9-57.0] mL/mg, respectively, p = 0.36.

Conclusions: Although there was no statistical difference in overall 24-hour UOP, the diuresis effect varied more greatly in the FUR group. Amongst this cohort, a potency ratio of 30:1 was found between FUR and BUM, versus historical found potency ratio of 40:1. UOP remained similar between the agents regardless of severity of hypoalbuminemia.
Effectiveness of pharmacist-led interventions on COPD outcomes at a small community hospital

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UAN: 0048-0000-18-230-L01-P

Learning Objectives:

1. Identify the roles a pharmacist has in patients with COPD.
2. Recognize ways you can incorporate these interventions in your institution.

Purpose:

Patients who are hospitalized for COPD have an increased risk of death and a poorer prognosis. In 2010 $32.1 billion dollars were spent nationally on medical costs for COPD and this is estimated to increase to $49 billion dollars by 2020. Alliance Community Hospital’s 30 day readmission rate for COPD is 20.5%; compared to the national rate of 19.8%. Alliance Community Hospital is currently implementing a bundle of pharmacist-led interventions targeted towards COPD patients.

Method:

Between November 1, 2017 and February 28, 2018 patients admitted to Alliance Community Hospital with COPD will be analyzed by retrospective chart review to determine if pharmacists are effective in reducing readmission rates. When a patient is admitted they first receive an admission medication reconciliation with a focus on identifying COPD medication related problems. The next step is education that consisted of pathophysiology, nonpharmacologic treatments, and inhaler technique. During this education piece the St. George Respiratory Questionnaire for COPD patients and the COPD Assessment Test were administered. The next step is a discharge medication reconciliation and education with a focus on medication affordability. Follow up phone calls were the last intervention which occurred 2-3 days, 7-10 days, and approximately 30 days after discharge. The primary outcome is COPD readmission rate. The secondary outcomes are a change in symptom severity, number of pharmacist interventions, and impact of patient demographics on the primary outcome.

Results:

Preliminary results show a COPD readmission rate for November 2017 through March 2018 of 11.7% compared to a previous readmission rate of 20.5%. As a result of this research project a full time clinical pharmacist position was approved. The remaining results will be presented at the 2018 Ohio Pharmacy Residency Conference.

Conclusions:

Data collection is complete and results are being analyzed. Conclusions will be presented at the 2018 Ohio Pharmacy Residency Conference.
Incidence Of Clostridium Difficile Infection And Impact Of Treatment With A Proton Pump Inhibitor On Recurrence At Summa Health System - Akron Campus

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Learning Objectives:

1. Describe the impact of Clostridium difficile infection on patients and acute care hospitals
2. Discuss the results of this quality assurance initiative

Purpose:
To assess whether patients with previous CDI who were put on a PPI were more likely to experience CDI recurrence than patients not taking a PPI. The primary endpoint is the rate of CDI recurrence in the PPI group vs. the non-PPI group. Secondary endpoints include the overall rate of CDI recurrence and comparative risk between groups at thirty, sixty, and ninety day intervals, percentage of patients with recurrent CDI taking a PPI at the time of recurrence, and the percentage of PPI discontinuation in patients with CDI and recurrent CDI.

Methods:
Inpatient medical charts were reviewed through Mercy Health CarePATH EPIC and Allscripts CPOE from September 1st 2015 to September 1st 2017. PPI use was assessed in patients diagnosed with CDI via Illumigene® PCR assay, defined as administration of ≥ 3 doses of a PPI while inpatient or outpatient PPI use within 3 months of admission. Recurrence was defined as a positive C. diff PCR result ≥ 14 days after the initial CDI.

Results: The rate of CDI recurrence for patients taking a PPI is 24.5% (n=61) versus 15.3% (n = 37) in patients not taking a PPI (P=0.011). Logistic regression yields an odds ratio of 1.7 (1.055 – 2.738) (P=0.029). The overall rate of CDI recurrence is 20% (n=98). The thirty day recurrence rate is 21.3% (n=13) in the PPI group versus 29.7% (n=11) in the non-PPI group (P=0.347). The sixty day recurrence rate is 18% (n=11) in the PPI group versus 27% (n=10) in the non-PPI group (P=0.293). The ninety day recurrence rate is 11.5% (n=7) in the PPI group versus 18.9% (n=7) in the non-PPI group (P=0.307). The recurrence rate beyond ninety days is 16.3% (n=16) in the PPI group versus 5.4% (n=2) in the non-PPI group (P=0.023). The rate of PPI use in the recurrent CDI group is 62.2% (n=61) versus 47% (n=188) in the non-recurrent group (P=0.011). The PPI discontinuation rate in recurrent CDI group is 23% (n=14) versus 18.1% (n=34) in the non-recurrent group (P=0.403). The overall rate of PPI use among patients with CDI is 50.7% (n=249).

Conclusions: CDI recurrence is higher in patients taking a PPI than in those not taking a PPI; this is only statistically significant when including the patients who experienced CDI recurrence beyond ninety days. Recurrence beyond ninety days is the only statistically significant secondary endpoint. PPI use is more prevalent in patients with recurrent CDI. These findings may be confounded by concurrent antibiotic administration.
Readmissions Associated with Chronic Obstructive Pulmonary Disease (COPD) Therapy within Long-Term Care Facilities: A Retrospective Analysis

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UAN: 0048-0000-18-147-L04-P

Learning Objectives:

1. Review 2017 GOLD Guidelines for COPD management
2. Describe the purpose for COPD medication management in Skilled Nursing Facility/Long-Term Care patients
3. Assess the need for pharmacist interventions in Skilled Nursing Facility/ Long-Term Care patients with COPD diagnosis

Purpose:
COPD and lower-pulmonary disease states are the third leading cause of death in the United States. Beginning in 2019 Skilled Nursing Facilities (SNF) and Long-Term Care (LTC) facilities will begin receiving penalties for hospital readmissions associated with COPD. To date, limited data has has been published on the role of the consultant pharmacist in managing patients with COPD. The purpose of this multi-center, retrospective study was to analyze data for patients with a diagnosis of Chronic Obstructive Pulmonary Disorder (COPD) to assess the rate of hospital readmissions, emergency department (ED) visits, and COPD exacerbations requiring. Secondarily, this analysis assisted in the identification for the need of pharmacist directed COPD patient care in SNF/LTC.

Methods:
This retrospective chart review focused on all patients with an active ICD-10 diagnosis code associated with COPD. Patient data was included based on the following criteria: resident of a participating facility, greater than 65 years of age, and medication orders managed through PointClickCare. Patient charts were reviewed for readmissions, ED visits, exacerbations, smoking status, and prescribed medications associated with a diagnosis of COPD from January through December 2017. The data collected was then compared to standard facility patients without COPD diagnosis to determine if additional pharmacist intervention is necessary for patients with this chronic disease.

Results: Results and conclusions will be presented at the Ohio Pharmacy Residency Conference.

Conclusions: Results and conclusions will be presented at the Ohio Pharmacy Residency Conference.
Evaluating the efficacy and safety of a heparin nomogram in cardiovascular surgery patients at a pediatric institution

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UAN: 0048-0000-18-148-L01-P

Learning Objectives:
1. Discuss risk factors of cardiovascular surgery that necessitate post-operative therapeutic anticoagulation
2. Describe parameters to assess the efficacy and safety of anticoagulation with heparin

Purpose:
Heparin therapy in pediatric patients has been poorly studied, leading to variations in dosing recommendations and monitoring parameters. Patients with cardiovascular disease and recent surgical history are at risk for unpredictable hemodynamic changes, which poses additional challenges for anticoagulation management. In December 2016, the cardiovascular surgery service at Children’s Hospital of Michigan (CHM) implemented a revised heparin nomogram with the goal of standardizing therapy for effective and safe anticoagulation in their patient population. The objective of this study is to evaluate the efficacy and safety of this revised nomogram.

Methods:
This retrospective cross-sectional study has been approved by the Institutional Review Board. The electronic medical record system identified patients admitted to the cardiovascular surgery service at CHM between December 2016 and February 2018 who received a continuous infusion of unfractionated heparin. Patients were excluded from the analysis if heparin therapy was initiated without a goal activated partial thromboplastin time (aPTT), duration of heparin therapy was less than 24 hours, or they were on extracorporeal membrane oxygenation (ECMO) or continuous renal replacement therapy (CRRT). The following data was collected from a retrospective chart review: patient age, gender, weight, height, surgical history, relevant comorbidities, laboratory indicators of coagulation and bleeding, and heparin therapy adjustments. The primary outcome evaluated the efficacy of the nomogram, determined by the mean time to first therapeutic aPTT. Secondary outcomes to evaluate safety included the incidence of bleeding and thrombotic events, as well as aPTT values not within therapeutic range. Continuous data were assessed using mean, median, and standard deviation. Results of this study will be used to evaluate the success of the nomogram and potentially guide modifications to improve patient care.

Results: Data collection and analysis are currently being conducted; results and conclusions will be presented at the 2018 Ohio Pharmacy Resident Conference.

Conclusions: Data collection and analysis are currently being conducted; results and conclusions will be presented at the 2018 Ohio Pharmacy Resident Conference.
The Impact of Institutional Order Sets Utilization on Cardiac Length of Hospital Stay

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UAN: 0048-0000-18-149-L04-P

Learning Objectives:

1. Discuss the impact of order set utilization on hospital length of stay and adherence to myocardial infarction guidelines
2. List the medication classes that are recommended for therapy in post-myocardial infarction patients

Purpose:
Technology plays a major role in hospital order entry now that Computerized Provider Order Entry (CPOE) is widely used in hospital settings. While entering orders for patients, providers have the option to enter a la carte orders through free hand text or use order sets, which are multiple orders grouped together by a clinical purpose. Utilizing hospital provided order sets offers convenience, standardization, patient safety, and adherence to evidence based medicine. The objective of this study is to evaluate the impact of utilizing hospital provided order sets in regards to patient length of hospital stay.

Methods:
A retrospective chart review was performed on patients admitted to Mercy Health – Lorain between January 1, 2017 through August 31, 2017 with a chest pain (CP) related ICD-10 diagnosis code with medications ordered from CP order sets. Length of stays were calculated from the time of decision to admit to the time of discharge for 155 patients admitted with chest pain diagnosis and were compared to the average length of stay (measured in days) determined by The Medicare Severity-Diagnosis Related Group (MS-DRG). Secondarily, the percentage of patients started on therapy consisting of a HMG-Co-A reductase inhibitor and/or beta adrenergic antagonist will be calculated as well to determine if the use of order sets allow for an increased adherence to the initiation of these medications with a 24 hours period.

Results: Data analysis is currently in progress.

Conclusions: Results and conclusions will be presented at the Ohio Pharmacy Resident Conference.
Evaluation of an educational campaign on the maintenance of and medication administration through small-bore feeding tubes

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UAN: 0048-0000-18-150-L04-P

Learning Objectives:

1. Discuss the potential impact of occluded small-bore feeding tubes
2. Recognize opportunities to improve medication administration via a small-bore feeding tube

Purpose:
Small-bore feeding tubes can occlude for various reasons including inadequate flushing, inappropriate medication administration, or protein coagulation. Occluded tubes may lead to increased costs, prolonged hospital stays, and worse patient outcomes. Occlusion rates of small-bore feeding tubes have been cited as high as 23% to 35%. The objective of this study was to evaluate the impact of an educational campaign on small-bore feeding tube occlusions.

Methods:
This was an institutional review board approved, retrospective chart review. Adult patients with a small-bore feeding tube placed by the nutrition support service were identified in January 2017 (pre-education) and August 2017 (post-education). A written educational campaign directed at nurses, pharmacists, and prescribers was delivered April 2017 through June 2017. Data extraction included patient characteristics, medications, protein administration, flushing documentation, diets, and tube occlusion data. Descriptive statistics were used.

Results: A convenience sample of 35 patients in each group was identified. Patients were followed for a mean of 10 days (pre-education) and 9 days (post-education). Small-bore enteral tubes (for tube feeds and medications) were present as the only enteral route in 26 (74%) and 29 (83%) of patients in the pre-education and post-education groups, respectively. Tube occlusions occurred in 4 (11%) patients in the pre-education group and 2 (6%) patients in the post-educational group. Documentation rates of flushing with medication administration were 35% (pre-education) and 43% (post-education). Around-the-clock flushing documentation rates were 47% (pre-education) and 53% (post-education). Mean number of missed opportunities for ordering a liquid medication was 3.63 per patient in the pre-education group and 4.17 per patient in the post-education group.

Conclusions: A lower incidence of tube occlusion and an improved rate of flushing documentation following an educational campaign were observed. The significance of these findings is difficult to determine due to many reasons, including the small sample size.
The Effect of a Therapeutic Guideline on Discharge Pain Prescriptions from an Emergency Department

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UAN: 0048-0000-18-151-L01-P

Learning Objectives:
1. Review the most current data regarding opioid abuse and overdose
2. Discuss the impact of a pharmacist driven therapeutic guideline for the treatment of pain at discharge from an emergency department

Purpose:
The abuse of opioids has dramatically increased leading to an increase in overdose deaths. Many national and state level practice-based guidelines were implemented to encourage proper prescribing of opioids. The purpose of this study is to evaluate whether the implementation of a therapeutic guideline based on patient-specific pain levels will more appropriately assist providers with the treatment of patients’ pain at discharge from the Emergency Department (ED).

Methods:
This retrospective cohort study evaluated the differences in discharge prescribing habits from the ED after implementation of a therapeutic guideline. The therapeutic guideline was created using the current treatment guidelines and was designed to create a patient-specific outpatient treatment regimen from his or her individual ED pain requirements. Included in the guideline is an opioid conversion table to assist providers with intravenous to oral converting. Education regarding the guideline was provided at an ED provider meeting and available as a pocket guide. The two studies periods included in this study were a pre-guideline implementation period from November 1st, 2016 to January 31st, 2017, and a post-guideline implementation period from November 1st, 2017 to January 31st, 2018. Patients receiving treatment for pain both in the ED and at discharge during these time periods were included in the study. Exclusion criteria include patients younger than 18 years, those with cancer-associated pain, and pregnant patients. The primary objective for this study is the percent change in total oral milligrams of morphine equivalents (MME) per day prescribed to a patient at discharge from the ED. Secondary objectives include provider satisfaction, percent change in classes of pain medications prescribed, and differences in prescribing patterns among the various provider types.

Results: Results will be presented at the 2018 Ohio Pharmacy Residency Conference.

Conclusions: Conclusions will be presented at the 2018 Ohio Pharmacy Residency Conference.
Evaluation of Adherence to ACC/AHA 2016 Outpatient Quality and Performance Measures in a Teaching Clinic

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UAN: 0048-0000-18-152-L04-P

Learning Objectives:

1. Assess the compliance of the Beaumont-Royal Oak Outpatient Clinic to the 2016 ACC/AHA outpatient performance measures
2. Assess the compliance of Beaumont-Royal Oak Outpatient Clinic to the 2016 ACC/AHA outpatient quality measures

Purpose:
To evaluate the quality of atrial fibrillation (AF) management, the American College of Cardiology (ACC)/American Heart Association (AHA) committee released Clinical Performance and Quality Measures for Adults with AF or Atrial Flutter in July 2016. In total, there are eleven outpatient measures recommended. These measures assess areas such as patient safety, effective clinical care, and communication and care coordination. The purpose of this study is to assess the adherence rates to the outpatient measures at the Outpatient Clinic (OPC) at Beaumont Hospital-Royal Oak.

Methods:
Beaumont Hospital Institutional Review Board approved this retrospective chart review. This study included patients 18 years of age or older with a documented continuity visit to the OPC between August 1, 2016 to October 15, 2017 with a charted diagnosis of AF or atrial flutter. Patients were excluded if inclusion criteria were not met. Investigators reviewed charts and collected necessary information for each measure the patient qualified for. Adherence to a measure was achieved when all pertinent components were met.

Results: Overall, high adherence rates were seen for measures addressing the management of rhythm control. Prescribing of nondihydropyridine calcium channel antagonists and beta-blockers in patients with a reduced ejection fraction also had high adherence rates. The adherence rate for appropriately prescribing anticoagulation was 83.1%. Documentation of the CHA2DS2-VASc score and monthly international normalized ratio for patients on warfarin had the lowest adherence rates, 25.6% and 58.2%, respectively. Low adherence was also seen when evaluating communication and shared decision making between physicians and patients in regards to risks and benefits of prescribing anticoagulation (9%).

Conclusions: Results have demonstrated the need for improved quality of care for AF patients. Initiatives to improve adherence rates begin with educating and informing the healthcare providers in the OPC.
Evaluating the impact of vancomycin troughs and area under the curve on nephrotoxicity in neonates

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Learning Objectives:

1. Recognize patient characteristics associated with nephrotoxicity in the neonatal population
2. Discuss the current literature available regarding the use of vancomycin AUC0-24 and trough concentrations within the neonatal population

Purpose:
Vancomycin is considered the mainstay of treatment for invasive gram positive infections in neonates. Although vancomycin-associated nephrotoxicity is uncommon (2.7%), higher trough concentrations have been associated with an increased risk of nephrotoxicity and there is a paucity of data evaluating the effects of AUC0-24 concentrations. While vancomycin’s exposure-toxicity relationship has been described in adult and pediatric patients, it remains to be fully elucidated in the neonatal population. The primary objective of this study was to examine the association between vancomycin trough and AUC on the incidence of nephrotoxicity in neonates.

Methods:
This was a retrospective chart review of neonatal patients between May 1, 2011 and July 31, 2017. Patients were eligible for inclusion if their post-menstrual age was less than 45 weeks, had received vancomycin for greater than 48 hours and had at least one documented steady state vancomycin level. Data collection included: age, weight, height, Apgar score, indication, maintenance dose, frequency, culture data, duration of therapy, serum creatinine, daily urine output and co-morbidities. The patient’s medical record was screened for any concomitant nephrotoxic medications. Trough levels and changes in vancomycin regimen were recorded. Data was analyzed to assess the incidence of AKI and to determine if a relationship exists between trough and calculated AUC and incidence of AKI. Patient’s categorization of kidney function was defined by the neonatal RIFLE (nRIFLE) criteria as an increased serum creatinine of 100%, a reduction of GFR of greater than 50%, or a urine output less than 1 milliliter per kilogram per hour for 24 hours.

Results: Data is currently being analyzed. Results and conclusions will be presented at the conference.

Conclusions: Data is currently being analyzed. Results and conclusions will be presented at the conference.
Review of the Management of Acute Agitation in the Inpatient Setting Following the Implementation of a Pilot Emergency Department (ED) Acute Agitation Protocol

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UAN: 0048-0000-18-154-L01-P

Learning Objectives:

1. Review current acute agitation practices at UHSJMC.
2. Evaluate the amount of IM ziprasidone used for patients admitted in-house pre- versus post-implementation of the acute agitation protocol.
3. Determine if the acute agitation protocol was followed.
4. Discuss the importance of implementing an acute agitation protocol in the inpatient setting.

Purpose:
Intramuscular (IM) ziprasidone, an atypical antipsychotic, is being used often for acute agitation at University Hospitals St. John Medical Center (UHSJMC). As IM ziprasidone is not indicated first-line for the management of acute agitation and the higher cost associated with this formulation, a review of its use was conducted. From this review, it was discovered that IM ziprasidone use in the ED only accounted for about a quarter of overall use. An original acute agitation protocol was then developed for the ED which was extrapolated for inpatient use. The purpose of this study is to evaluate if the implementation of an acute agitation protocol in the inpatient setting helps reduce the unnecessary use of IM ziprasidone.

Methods:
A retrospective chart review will be conducted from November 2016 to March 2017 (pre-agitation protocol) and November 2017 to March 2018 (post-agitation protocol) for patients who received IM ziprasidone at UHSJMC. The data will be reviewed through the electronic medical records (EMR) of patients who received IM ziprasidone and stored in a secured document. Information that will be collected include: patient age, sex, QTc level, past psychiatric history, antipsychotic agents used, timing of administration of antipsychotic agents, doses dispensed, psychiatry consult, location of patient, and any other important information. Data will be evaluated to assess the amount of overall IM ziprasidone utilized using descriptive and inferential statistics. Mann Whitney U will be used to compare the pre-post data after the protocol implementation. A logistic regression analysis will be completed to determine factors that influenced compliance with the one dose protocol prior to psychiatric consult.

Results: Results to be presented after completion of the study.

Conclusions: Conclusions to be presented after completion of the study.
Assessment of Community Pharmacists’ Confidence, Foundational Knowledge and Coordination of Care Activities in Patients with Cancer as a Chronic Condition

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UAN: 0048-0000-18-155-L04-P

Learning Objectives:
1. Explain the rational for administering continuing education in oncology for community pharmacists and resources to utilize
2. Identify the different types of data used and what statistical tests were used to evaluate the objectives

Purpose:
The purpose was to provide a structured educational program for community pharmacists focused on building a foundational knowledge of cancer and cancer therapy. The specific objectives were to 1) develop and provide an educational program and 2) measure the program’s impact on community pharmacists’ confidence, foundational knowledge, and coordination of cancer care activities. This project is significant to community pharmacy because it allows pharmacists to fill an unmet healthcare need to better assist the growing population of patients who are surviving cancer utilizing new treatment modalities.

Methods:
Twenty-two community pharmacists attended a 6-hour continuing education (CE) session created by three oncology certified pharmacists and a community pharmacist. Webinars were then presented at week 5 and week 8 after the CE session based on requested topics. Pharmacists provided anonymous feedback including what community pharmacists should know about oncology. Two survey tools were used. The first survey tool measured confidence and knowledge before and after the CE session. The second survey tool provided a look back view on confidence, knowledge and coordination of care before the CE and after the CE and webinars. This survey was completed 10 weeks post the CE day.

Results: Pharmacists had a mean of 4.8 years of experience. Pharmacists reported receiving questions about cancer once a month (66% n=18) on a Likert scaling of never to weekly. Pharmacists ranked confidence in recommending OTC products to a patient as somewhat comfortable (61% n=18) prior to the CE and as comfortable (50% n=20) post CE on a Likert scale of not comfortable to very comfortable. Evaluations of the CE were positive. Communications post-CE suggests pharmacists’ increased awareness and empowerment.

Conclusions: The CE provided relevant information for the pharmacist to increase confidence. The pharmacists providing the CE learned about the community pharmacist’s perspective.
Prevalence of Surgical Site Infections after Colorectal Surgery with Cefazolin plus Metronidazole versus Ertapenem Pre-Op Prophylaxis

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Learning Objectives:

1. Review the current guidelines on prophylaxis of surgical site infections in colorectal surgery
2. Discuss factors that may lead to surgical site infections in colorectal surgery

Purpose:
Ertapenem (ETP) was the primary agent for colorectal surgery prophylaxis prior to January 1, 2017, when our institution switched to cefazolin plus metronidazole (CEF) due to cost effectiveness and a favorable side effect profile. Studies comparing ETP to alternative agents have conflicting results regarding rates of SSIs and Clostridium difficile infections (CDIs). The purpose of this study is to determine whether CEF is non-inferior to ETP for prevention of SSIs after colorectal surgery at Beaumont Hospital-Dearborn.

Methods:
This retrospective, quasi-experimental, non-inferiority study reviewed patients undergoing colorectal surgery who received ETP from January 2016 to December 2016 and CEF from January 2017 to December 2017. Patients with bacterial infection, other antibiotic use, contraindications to ETP or CEF, revision of surgery, and emergency surgery were excluded. Variables collected for analysis included baseline demographics, comorbidities, immunosuppression, and surgery indication and type. The primary outcome was defined as SSI within 30 days post-surgery. The secondary outcome was defined as adverse events, including CDIs, within 30 days post-surgery. The pre-specified non-inferiority margin was set at 15%.

Results: Of the 160 patients included in the study, 81 (50.6%) received ETP and 79 (49.4%) received CEF. The prevalence of SSIs was not significantly different between groups (1.2% versus 3.8%; P = 0.364). CEF was found to be non-inferior to ETP for prevention of SSIs (ARD 2.6%; 95% CI -2.28% to 7.42%). More patients in the CEF group had rectal cancer (6.2% versus 20.3%; P = 0.01) and temperature ≥ 96.8°F during surgery (43% versus 64%; P = 0.01). CDI was observed in 1 ETP and 0 CEF patients (P = 0.455).

Conclusions: CEF was not associated with significantly higher rates of SSIs compared to ETP for colorectal surgery prophylaxis. CEF appears to be an appropriate and effective alternative to ETP for use in colorectal surgery prophylaxis.
Evaluation of cinnamon oil versus fluconazole in the treatment of oral candidiasis

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UAN: 0048-0000-18-157-L01-P

Learning Objectives:

1. Identify current treatment options for oral candidiasis
2. Discuss and compare susceptibilities of cinnamon oil and fluconazole to different Candida species

Purpose:
Cinnamon oil has shown to be susceptible in vitro to various Candida species, however there is a lack of efficacy, safety, and tolerability data of cinnamon oil in vivo. The aim of this study is to compare cinnamon oil to fluconazole in the treatment of oral candidiasis.

Methods:
A retrospective chart review was conducted to identify patients diagnosed with oral candidiasis and treated with cinnamon oil, fluconazole, or both at Mercy Health–Regional Medical Center from October 2016 through July 2017. Data collected includes gender, age, symptomatic improvement, length of treatment, patient refusal of any treatment, total number of doses refused, cost of treatment, reported adverse drug events from therapy, and cost of treatment due to adverse drug event. Symptomatic improvement and reported adverse drug events were assessed through review of physician and nursing notes. All of the data was analyzed and compared between the three treatment groups to evaluate efficacy, safety, and tolerability.

Results: A total of 131 subjects were reviewed; 112 in the cinnamon oil group, 14 in the fluconazole group, and 5 in the cinnamon oil and fluconazole group. Symptomatic improvement was noted in 60% of patients treated with both cinnamon oil and fluconazole compared to 41.1% with cinnamon oil and 28.6% with fluconazole. Adverse events were reported in 2 patients in the cinnamon oil group and none in the other treatment arms. Patients receiving cinnamon oil therapy received, on average, only half of the doses ordered and 98.2% of these patients refused at least 1 dose, while no patient refused treatment with fluconazole.

Conclusions: Results of this study illustrated greater success when combining cinnamon oil and fluconazole for treatment of oral candidiasis compared to either option alone. Tolerability of cinnamon oil also poses an issue compared to other treatment options for oral candidiasis.
Clinical and Economical Assessment of Epoetin Alfa: A Drug Use Evaluation

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Learning Objectives:

1. Describe the therapeutic use of Epoetin Alfa
2. Outline the economic impact of Epoetin Alfa use in a hospital system and available alternatives

Purpose:
Epoetin alfa is an erythropoiesis-stimulating agents (ESA) used to stimulate the endogenous production of red blood cells. Its chronic use has had a major impact in reducing blood transfusions including with anemia associated with chronic renal failure. Epoetin alfa does have a number of adverse effects including a US Boxed Warning for increased risk of death, serious cardiovascular events and stroke when targeting hemoglobin >11g/dL. With the known adverse effects of ESAs safe and effective drug use prior to and throughout therapy needs to be evaluated. The evaluation should include baseline laboratory values include; hemoglobin, hematocrit and iron studies. At Ahuja Medical Center epoetin alfa is the only ESA. However, darbepoetin alfa may be a cost-effective formulary alternative due to its pharmacokinetic properties and dosing options.

Methods:
This will be a retrospective drug use evaluation conducted at University Hospitals Ahuja Medical Center. The drug use evaluation will include patients ordered epoetin alfa at Ahuja Medical Center in 2017. The sample of patients for this drug use evaluation will be obtained through historical drug recall in the electronic medical record (UHCare). Patients may be enrolled more than once if ordered epoetin alfa at separate hospital visits. Multiple data points will be collected including; demographics, dosing of epoetin alfa, baseline laboratory values, change in epoetin alfa dosing, darbepoetin alfa equivalence and three time weekly equivalent dosing of epoetin alfa if originally dosed once weekly. The primary objective will be to characterize use of epoetin alfa at Ahuja Medical Center. Secondary objectives include evaluation of the cost effectiveness of alternative medications and dosing strategies based on prescribing practices.

Results: Data collection is in progress. The results of this drug use evaluation will be presented at the Ohio Pharmacy Resident Conference.

Conclusions: N/A
**Association of various tacrolimus trough concentrations on renal allograft survival and the development of adverse effects**

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**UAN: 0048-0000-18-159-L01-P**

**Learning Objectives:**

1. Describe what current guidelines and evidence suggest regarding tacrolimus trough targets
2. Evaluate the observed impact of various tacrolimus trough concentrations as they relate to graft failure and adverse effects in kidney transplant recipients at the University of Toledo Medical Center

**Purpose:**
The 2009 KDIGO Clinical Practice Guideline for the Care of Kidney Transplant Recipients recommend tacrolimus, a calcineurin inhibitor (CNI), as first line therapy for the initial maintenance of immunosuppression in kidney transplant recipients. Despite this, studies comparing the effect of different tacrolimus trough concentrations in the background of standardized immunosuppression are limited. This study will look to add to the available literature by comparing various tacrolimus trough ranges over the first year post-transplantation and their effect on the incidence of graft survival and CNI-related adverse effects.

**Methods:**
A retrospective chart review of patients undergoing kidney transplantation at the University of Toledo Medical Center was conducted for the time period of March 14, 2006 to April 15, 2015. Patients were included if they were &gt;18 years of age, underwent induction therapy with alemtuzumab, and received initial maintenance immunosuppression therapy with tacrolimus and mycophenolate. Patients were then stratified into three groups based on their average tacrolimus trough concentration over the first year post-transplantation; 10 mg/dL. The primary endpoint was incidence of death-censored graft failure. Development of CNI-related adverse effects was a secondary endpoint.

**Results:** Data collection has been completed. Statistical analysis and results to be presented at OPRC.

**Conclusions:** Conclusions to be presented at OPRC.
**Evaluation of Anti Xa Level Monitoring During Transition from Oral Factor Xa Inhibitors to Unfractionated Heparin Infusion**

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**UAN: 0048-0000-18-160-L01-P**

**Learning Objectives:**

1. Identify the concerns associated with using anti Xa levels to monitor heparin infusions during transition from oral factor Xa inhibitors
2. Discuss the correlation between PTT and anti Xa levels in patients receiving oral factor Xa inhibitors transitioning to heparin infusions

**Purpose:**
Due to significant variability of partial thromboplastin time (PTT) monitoring and quicker achievement of therapeutic levels with anti Xa monitoring, more hospitals have moved towards utilizing anti Xa levels to monitor unfractionated heparin (UFH) infusions. Some articles have shown increased anti Xa levels during transition from oral Xa inhibitors to UFH infusions. Additionally, an article suggested that increased anti Xa levels during this transition is possibly a false elevation based on their review of available literature. The purpose of this study is to evaluate anti Xa level monitoring during transition from oral factor Xa inhibitors to UFH infusions.

**Methods:**
The research is an observational retrospective study. The institutional laboratory collected both PTT and anti Xa levels on all patients requiring continuous heparin infusion from November 2017 to January 2018. Levels were excluded if patients were less than 18 years of age, discontinuation of heparin infusion in less than 6 hours, or levels drawn after 72 hours of infusion initiation. Investigators inspected collected labs and electronic medical records to identify patient who were on oral Xa inhibitors prior to start of UFH infusions. PTT and anti Xa levels in patients without previous Xa inhibitor use were used as the control group, and levels in patients with previous Xa inhibitor use were used as the case group. Patients were matched based on baseline demographics. Anti Xa and PTT levels were graphed on a Brill-Edwards plot for case and control groups. Correlation coefficients, slopes, and intercepts were compared with Z-tests.

**Results:** Data analysis is currently being conducted.

**Conclusions:** Results and conclusions will be presented at the Ohio Pharmacy Residency Conference.
Evaluation of the acceptance of pharmacists’ antimicrobial use interventions after the implementation of a 48–72 hour antimicrobial “time-out” at a rural, community hospital

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Learning Objectives:

1. Describe the impact of an Antimicrobial Stewardship Program and the role of the pharmacist as a core team member
2. Identify meaningful interventions made by pharmacists to the healthcare team through the implementation of an antimicrobial “time-out”

Purpose:
The Center for Disease Control and Prevention (CDC), Centers for Medicare and Medicaid Services (CMS), and The Joint Commission (TJC) have published guidelines for Antimicrobial Stewardship Programs (ASPs) with recent recommendations to implement a “time-out” to assess empiric antimicrobial therapy after 48 hours of use. This study aimed to evaluate the acceptance rate of antimicrobial use interventions made by pharmacists to health care providers through the implementation of a 48-72 hour antimicrobial “time-out”.

Methods:
Patients on antimicrobial agent(s) were reviewed 48-72 hours after initiation of therapy. Interventions recommended by pharmacists included duration of therapy, intravenous (IV) to oral (PO) conversion, and change, de-escalation, or discontinuation of therapy based on cultures and sensitivities as well as clinical status. An assessment checklist was utilized to ensure evaluation for potential interventions were consistent among pharmacists. Interventions made for patients admitted to the hospitalist service at Firelands Regional Medical Center from December 2017-February 2018 were included in the study. Exclusion criteria included patients less than 18 years old, pregnant women, surgical patients, incomplete or duplicate interventions, and hospital approved automatic IV to PO conversions. The primary outcome evaluated was the percent of accepted pharmacist interventions. Secondary outcomes included the percent of appropriate empiric antimicrobial therapy and accepted interventions based on the category of intervention and site of infection.

Results: Pharmacists assessed 232 during the 48-72 hour “time-out” and made 123 interventions. Of the interventions made, 54% were accepted within 24 hours. Appropriate empiric antimicrobial therapy was initiated on 95% of the patients assessed. Duration of therapy was the most common category of intervention made and accepted at 58%. With respect to site of infection, uncomplicated urinary tract infection interventions had the highest acceptance rate at 50%.

Conclusions: This study demonstrated that pharmacists have a vital role in ASPs by improving antimicrobial use through meaningful interventions.
Impact of bispectral index monitoring on analgesia and sedation in patients with acute respiratory distress syndrome on sustained neuromuscular blockade

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UAN: 0048-0000-18-162-L01-P

Learning Objectives:
1. Describe the role of neuromuscular blocking agents in acute respiratory distress syndrome.
2. Discuss the use of bispectral index for monitoring sedation in patients on neuromuscular blockade.

Purpose:
The purpose of this study is to determine the impact of bispectral index (BIS) monitoring on analgesia and sedation in patients with acute respiratory distress syndrome (ARDS) on neuromuscular blocking agents (NMBA).

Methods:
This is a retrospective study of patients admitted to Detroit Receiving Hospital and Harper University Hospital from January 2011 to June 2017 and received a 24-48 hour continuous infusion of cisatracurium for ARDS. The primary outcome is the cumulative dose of sedatives (in lorazepam-equivalents) and analgesics (in fentanyl-equivalents) over the duration of cisatracurium infusion. Secondary outcomes include frequency of analgesia/sedation titrations, incidence of delirium, barotrauma and tracheostomy, ventilator free days, and ICU free days. Continuous data and nominal data were compared using the Wilcoxon rank-sum test and Fisher’s exact test, respectively. P-values < 0.05 were considered statistically significant.

Results: A total of 20 unique patient encounters meeting all inclusion criteria were collected during the study period, 9 patients who received BIS monitoring and 11 patients who did not. Patients without BIS monitoring received a significantly greater cumulative amount of analgesia, median 9.93mg (4.96-20.0mg), compared to 4.03mg (1.79-9.12mg) for patients with BIS (P = 0.04). The BIS group experienced a significantly greater number of analgesia/sedation titrations for the duration of NMBA, median 3 dose changes (2.5-6), compared to 1 (1-2) for the standard group (P

Conclusions: For patients with ARDS on NMBA, the use of BIS monitoring resulted in a lower cumulative amount of analgesia. However, BIS monitoring also increased the number of sedation/analgesia titrations without improving clinical outcomes or decreasing adverse events. Thus, BIS monitoring should not be used to monitor level of sedation in ARDS patients on NMBA.
Implementation and evaluation of a direct acting oral anticoagulant (DOAC) management service in the anticoagulation clinic (ACC)

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Learning Objectives:
1. Discuss the opportunities and obstacles that exist in the management and monitoring of direct oral anticoagulant (DOAC) therapy
2. Describe a feasible model for a pharmacist-led outpatient DOAC management service

Purpose:
Since 2010, there have been five DOACs approved and made available for use in the United States. While ACCs have traditionally been focused on warfarin management, creation of an ACC that encompasses management of all oral anticoagulants could result in significant improvement in safety and efficacy outcomes. Limited evidence describing DOAC management models exists. The purpose of this study is to evaluate the operational feasibility of a DOAC management model integrated within an existing ACC (1), quantify frequency and qualitatively describe pharmacist interventions (2), and compare rates of inappropriate prescribing, dosing, monitoring, and adherence between the DOAC management service and usual care (3).

Methods:
This is a single center, retrospective case-control study that will be conducted at an urban teaching hospital post-DOAC management service implementation. The electronic medical record will be used to collect data on patients referred to the pharmacist-run clinic and have received at least 3 months of care. We will include a 1:1 matched cohort of patients who have been prescribed a DOAC and managed by their physician in outpatient internal and family medicine primary care clinics from 2011 to present. The groups will be matched based upon age and indication for DOAC agent. The following data will be collected: patient demographics, past medical history, medication history, referral type, number of visits for DOAC management, medication discrepancies, pharmacist time to complete each visit and associated tasks, number of triaged events, baseline and follow-up laboratory parameters, bleeding and thromboembolic events, adherence rates, frequency of drug access issues, and type of drug interactions. Analysis will be conducted using descriptive statistics, Chi-square, and Student’s t-test.

Results: Data analysis is currently being conducted.

Conclusions: It is hypothesized that results will demonstrate the feasibility of integrating DOAC management into a traditional ACC, and the positive effect pharmacists have in the management of DOACs.
Evaluation of Clinical Outcomes of Continuous Infusion versus Intermittent Bolus Administration of Proton Pump Inhibitors for Active, Non-variceal, Upper Gastrointestinal Bleeding

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Learning Objectives:

1. Describe the rationale for continuous infusion and intermittent bolus proton pump inhibitor administration in upper gastrointestinal bleeding.
2. Discuss the outcomes of using intermittent bolus proton pump inhibitor regimens in comparison with continuous infusion regimens.

Purpose:
Current guidelines from the American College of Gastroenterology (ACG) recommend administering an intravenous proton pump inhibitor (PPI) bolus followed by continuous infusion as first-line therapy in patients with high-risk stigmata who have also received early endoscopic therapy. There is mounting evidence that intermittent bolus regimens may produce similar clinical outcomes. This study aims to evaluate the efficacy and safety of intermittent bolus versus continuous infusion PPI therapy in patients with non-variceal upper gastrointestinal bleeding.

Methods:
A multi-center, retrospective chart review included patients 18 years and older with an endoscopically confirmed non-variceal upper gastrointestinal ulcer with high-risk bleeding stigmata. Patients were not eligible for inclusion if they had any of the following: a variceal hemorrhage, PPI use within the past seven days, emergent surgery after endoscopy, low-risk stigmata identified by endoscopy, lower GI bleeding, gastric or duodenal cancer, a history of adverse reactions to PPIs, or pregnancy. Patients were classified into one of three groups dependent on the PPI regimen they received post-endoscopy: guideline-based care (pantoprazole 80 mg bolus followed by 8 mg/hour continuous infusion for 72 hours), patients placed onto an intermittent bolus before the 72 hours ended, and patients receiving longer than 72 hours of PPI continuous infusion. The primary outcome was rebleeding within 7 days of admission for a non-variceal upper gastrointestinal bleed for which the patient received any PPI regimen. Secondary outcomes included length of hospital stay, need for surgical intervention, transfusion requirements, thirty-day all-cause mortality, and cost difference between the regimens. The primary outcome was analyzed using a Fisher’s exact test, while the student’s t-test was used for continuous data.

Results: Data collection and analysis are ongoing. Results and conclusions will be presented at the 2018 Ohio Pharmacy Residency Conference.

Conclusions: Data collection and analysis are ongoing. Results and conclusions will be presented at the 2018 Ohio Pharmacy Residency Conference.
Impact of an inpatient pharmacist-driven protocol to optimize acid suppressive therapy across the patient care continuum

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UAN: 0048-0000-18-165-L04-P

Learning Objectives:
1. Review background of acid suppressive therapies, including indications and risks of use
2. Discuss implementation of a pharmacist-driven protocol for optimization of therapy
3. Identify strategies of improvement of such a protocol in the community hospital

Purpose:
Risks associated with use of acid suppressive therapy (AST), particularly proton pump inhibitors (PPIs), include Clostridium difficile infection, osteoporotic bone fracture, and pneumonia. AST is commonly overused within healthcare systems, and hospitalized patients are often inappropriately initiated on stress ulcer prophylaxis. This study aims to limit misuse of AST by means of a pharmacist-directed protocol utilizing defined gastric bleeding risk factors to discontinue therapy. Comprehensive pharmacist review of inpatient AST orders as well as outpatient AST prescriptions will limit unnecessary continuation of AST for patients while hospitalized and at discharge.

Methods:
This prospective interventional study describes the impact of pharmacist-driven discontinuation of AST in hospitalized patients across the continuum of patient care. This comprehensive protocol has three aims: to assess appropriateness of outpatient AST upon admission, throughout hospitalization, and at discharge. Patients are assessed upon admission for appropriate AST indications by means of a questionnaire. Questionnaires of patients using AST in outpatient settings are assessed by clinical pharmacists for possibility of discontinuation or tapering as appropriate upon hospital admission. Patients initiated on AST while inpatient are monitored daily for resolution of risk factors for gastric bleeding in order to discontinue prophylactic AST via clinical pharmacist review of daily reports of patients on AST. Pharmacist discharge medication reconciliation activities include interventions for discontinuation or limitation of AST therapy upon patient discharge as well as patient counseling on discontinuation or tapering of AST as appropriate. The primary outcome is the number of pharmacist interventions to discontinue AST medications. Secondary outcomes include the number of recommendations to taper AST upon patient admission and at discharge and number of patients counseled about AST at discharge.

Results: Data is currently being analyzed; results will be presented at the Ohio Pharmacy Residency Conference.

Conclusions: Conclusions will be presented at the Ohio Pharmacy Residency Conference.
Characterization of Bleeding Events in Patients with Supratherapeutic International Normalized Ratio

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UAN: 0048-0000-18-166-L04-P

Learning Objectives:

1. Describe the risk factors associated with bleeding events in patients with elevated INRs.
2. Discuss the available treatment options are available to reverse bleeding from warfarin.

Purpose:
Warfarin anticoagulation in hospitalized patients remains common due to ease of monitoring using the international normalized ratio or INR. Supratherapeutic anticoagulation may occur during acute illness and therefore identifying at-risk patients who may be more prone to bleeding events is important, allowing for a more targeted approach to reversal. We sought to study patients with INR values ≥4.5, developing during their hospital admission, and characterize their bleeding events and potential risk factors.

Methods:
Inpatients who were actively on warfarin between January 1, 2015 to December 31, 2016 with an INR ≥4.5 were included. Demographic and laboratory variables were collected. Comorbid conditions and organ dysfunction were recorded. Administration of antiplatelet drugs, aspirin, and corticosteroids were documented. The primary objective was to determine which patient risk factors, if any, are associated with an increased incidence of major or fatal bleeding while on warfarin therapy with supratherapeutic INR. Major bleeding was defined as a drop in Hgb of > 2 gm/dl requiring intervention and escalation of care; any critical organ bleeding, any ICH.

Results: A total of 724 patients were screened; 287 were excluded and a total of 437 patients (193 male, 244 female) were included. Average age was 65 +/- 14. Of the 437 patients included, 20 patients had a bleed while 417 patients did not. Events included: epistaxis 1, gastrointestinal 10, hematoma 1, intracerebral hemorrhage 1, minor bleeding at IV site 1, multiple sites 1, oral-pharyngeal 1, ovarian hemorrhagic cyst 1, rectal 1, and retroperitoneal 1. Of the 20 bleeds, 12 were major and 8 were minor bleeds. There was no difference in age (p=0.594), gender (p=0.649), or admit duration (p=0.318) between patients who did or did not bleed. Initial elevated INRs were similar between bleeding and non-bleeding groups (5.95 +/- 1.26 vs 5.97 +/- 2.30, p=0.708), respectively. More patients in the bleeding group had elevated serum creatinine (3.65 +/- 0.99 vs 2.33 +/- 0.12, p=0.010), co-administration of clopidogrel (OR 2.94, 95% CI [1.08-7.99]), history of gastrointestinal bleed (OR 16.24, 95% CI [6.04-43.66]), history of any bleed (OR 15.20, 95% CI [5.86-39.51]), and on dialysis (OR 2.97, 95% CI [1.14-7.73]).

Conclusions: Patients who are dialysis, on clopidogrel, and/or have had pervious bleeds are at higher risk of bleeding inpatient with elevated INR ≥4.5. A more aggressive reversal strategy should be employed in these patients.
Impact of a pharmacist-driven detailed penicillin allergy interview

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UAN: 0048-0000-18-167-L04-P

Learning Objectives:

1. Review the classification of allergy reaction types
2. Explain methods for clarifying a penicillin allergy

Purpose:
In the United States, 10% of patients report a penicillin (PCN) allergy. These self-reported allergies may be outdated or inaccurate, which may lead to usage of alternate antimicrobials that may be less effective, more toxic, and/or more expensive. While PCN skin tests (PST) can provide an accurate assessment and de-labeling of PCN allergies, they are not feasible at all institutions. An alternative solution is to conduct a detailed penicillin allergy interview (DPAI), which can potentially lead to de-escalation and/or optimization of antimicrobial therapy. The objectives of this study were to characterize changes made to the allergy profile within the electronic health record (EHR) after DPAI and to measure the number of patients successfully switched to beta-lactam therapy.

Methods:
Pharmacist-driven DPAIs were implemented at our institution on December 26th, 2017. Adult patients admitted with a documented PCN allergy were interviewed according to a standardized questionnaire. The allergy profile within the EHR was updated and a recommendation to switch to beta-lactam therapy was made to the prescriber when indicated based on a decision algorithm.

Results: A total of 229 patients admitted with a documented penicillin allergy were screened, of which 175 (90.2%) received DPAI. Of these patients, 131 (74.9%) required a change to their allergy profile (e.g. addition of previous tolerance, modification of reaction type, or deletion of allergy). One-hundred thirty-five (77.1%) patients interviewed were on an antimicrobial agent. Forty-two patients (31.1%) met criteria to switch to beta-lactam therapy, and 31 (73.8%) patients were successfully switched with no adverse events.

Conclusions: A large number of admitted patients with a documented PCN allergy received a DPAI. Implementation of pharmacist-driven DPAIs led to updated, more accurate allergy information within the EHR, as well as de-escalation and/or optimization of antimicrobial therapy. Provider acceptance rate to switch to beta-lactam therapy was high in our study.
Protecting the pump: Evaluation of warfarin therapy in left ventricular assist device (LVAD) patients

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UAN: 0048-0000-18-168-L01-P

Learning Objectives:
1. Discuss the need for anticoagulation in left ventricular assist device (LVAD) patients
2. Identify the need for research regarding the use of warfarin in LVAD patients

Purpose:
Left ventricular assist devices (LVADs) have significantly improved survival rates in patients with advanced heart failure, but they are associated with potentially serious complications, including alterations in normal coagulation that may result in thrombosis. Warfarin is considered to be the anticoagulant of choice in reducing the risk of thrombosis, as the pharmacokinetics of newer oral anticoagulants in LVAD patients are unknown and their safety and efficacy have not been determined. However, warfarin has proven to be difficult to manage in LVAD patients, who are at increased risk of both thromboembolism and bleeding. The objective of this study is to determine how successful the current management of LVAD patients’ warfarin therapy is in terms of safety and efficacy, and to determine the impact on patient outcomes and costs.

Methods:
This retrospective cohort study is being conducted via chart review and includes data generated from November 1, 2011 through October 31, 2017. Patients are eligible for inclusion in the study if they are 18 years or older, have had an LVAD placement, and have received maintenance anticoagulation therapy with warfarin. The primary endpoint is the percentage of time in therapeutic range of LVAD patients’ warfarin therapy. Secondary endpoints include determination of the rates of bleeding and thrombotic events in LVAD patients and the performance of a cost analysis of warfarin therapy-related outpatient monitoring and inpatient admissions.

Results: Research is in progress. Of the 43 patients enrolled in the LVAD program during the study period, all 43 were eligible for inclusion. Nine patients (20.9%) are currently active in the program, while 22 are deceased (51.2%), 5 have received heart transplants (11.6%), 4 have had their LVAD explanted (9.3%), and 3 have transferred out of the program (7.0%).

Conclusions: Will be presented at the 2018 Ohio Pharmacy Resident Conference.
Individualized Pharmacy Technician Peer Training Program: Impact on Community Pharmacy Technician Retention

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UAN: 0048-0000-18-169-L04-P

Learning Objectives:

1. Recognize the importance and impact of increased pharmacy technician retention
2. Summarize the role of a peer technician trainer in an individualized peer training program

Purpose:
The primary objective of this study is to assess the impact of an individualized peer training program on technician retention in a community pharmacy setting. The secondary objective is to assess the impact of the peer training program on technician retention within subgroups of pilot stores based on their patient demographics and prescription volume.

Methods:
Turnover of pharmacy technicians affects team productivity and has significant financial implications. A mandatory individualized peer training program was implemented September 1, 2017 at 36 pilot stores within one regional division of a national grocery store chain pharmacy. The program’s intent is to increase retention among newly-hired pharmacy technicians. The training program utilizes guided activities pertaining to pharmacy law, calculations, professional jargon, basic pharmacology, and daily job functions, followed by an individualized face-to-face meeting with a peer technician trainer. The 36 pilot stores were selected due to their high historical rates of technician turnover and geographic proximity to a peer technician trainer. This study will compare technician retention at pilot stores after implementation of the training program relative to a historical control group. The intervention group consists of all technicians hired at the 36 pilot stores between September 1, 2017 and November 30, 2017. The historical control group includes all technicians hired at the same 36 stores over the same calendar months in the previous year. Approximately 40 new technicians are anticipated in the intervention and control groups based on historical data. The difference in the percentage of technicians retained at 90 and 180 days post-hire will be compared between groups using descriptive and inferential statistics. For the secondary objective, descriptive traits such as prescription volume (low, intermediate, high, and very high), neighborhood socioeconomic status (low, middle, and high), and primary customer population (Caucasian, African American, and multi-ethnic) will be used to describe study sites. These are existing discrete categories created and used by The Kroger Co., Columbus Division. The percentage of technicians retained will be compared between subgroups to further investigate the potential associations between site-specific demographic factors and the change in the percentage of technician retention.

Results: There was no statistically significant difference found overall or between subgroups 90 days after hire. Collection of data 180 days post hire is ongoing.

Conclusions: Implementation of an individualized peer pharmacy technician training program did not result in a statistically significant increase in retention at 90 days post hire. Further assessment is needed to understand the appropriateness and utility of such programs to improve 90 day retention. Collection and analysis of data 180 days post hire is ongoing.
Beating Diabetes: The Use of a Novel Nutrition and Medication Adherence Measure to Improve the Outcomes of Patients with Diabetes

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UAN: 0048-0000-18-170-L04-P

Learning Objectives:

1. Identify the opportunity for interdisciplinary management of diabetes in the community pharmacy setting.
2. Describe an individualized, interdisciplinary diabetes program driven by the use of a novel nutrition and medication adherence measure.

Purpose:
The purpose of this study was to measure the impact of individualized interventions for patients with diabetes on clinical outcomes such as hemoglobin A1c, blood pressure, and BMI, compared to current standard practice in the community pharmacy.

Methods:
This randomized, controlled trial evaluated a multidisciplinary diabetes care program implemented in twenty locations of a large chain supermarket pharmacy. This program provided pharmacist and dietitian-led interventions based upon five distinct patient segment categories, which were derived from medication use, monitoring, and level of nutrition. Patients were enrolled from September 2017 to March 2018 and were randomized to receive either individualized, data-driven interventions or standard care within the pharmacy. Data from prescription records, loyalty information, and grocery store purchases were integrated to develop the patients’ novel diabetes therapy scores. Recommended interventions were provided to the pharmacy staff through the pharmacy dispensing software, to aid the identification of clinical opportunities. Interventions included, but were not limited to, comprehensive medication reviews, customized education based upon patient assessment, dietitian consults, and grocery store tours. Hemoglobin A1c (HbA1c), blood pressure (BP), body mass index (BMI), patient segment, nutrition score, and medication adherence scores were collected at baseline and six months. The primary endpoint in this study was change in HbA1c. Secondary clinical endpoints included change in BP, BMI, patient segment, nutrition score, and medication adherence scores.

Results: This research is currently in progress.

Conclusions: This research is currently in progress. Our hypothesis is that the provision of multidisciplinary, individualized interventions driven by nutrition and adherence data will result in improved clinical outcomes for patients with diabetes.
Prevention of postoperative nausea and vomiting utilizing aprepitant 80mg in patients undergoing laparoscopic sleeve gastrectomy

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UAN: 0048-0000-18-171-L01-P

Learning Objectives:

1. Describe challenges of providing appropriate nausea relief for patients undergoing laparoscopic sleeve gastrectomy
2. Discuss the potential benefit of adding aprepitant to the antiemetic regimen in order to decrease post-op nausea and vomiting

Purpose:

Purpose: Postoperative nausea and vomiting (PONV) is a major cause of patient dissatisfaction towards surgery. It is defined as any nausea, retching, or vomiting occurring during the first 24-48 hours after surgery in inpatients. Several risk factors for PONV include: female gender, younger age, non-smoking status, and having a history of PONV or motion sickness. After bariatric surgery, increased nausea, vomiting, and/or retching is detrimental. It can lead to delayed or intolerant oral intake, dehydration, electrolyte imbalance, potential kidney injury, pulmonary aspiration, pain, increased length of hospital stay, and decreased patient satisfaction.

At Mercy Health- Fairfield Hospital, a 230 bed, community hospital, antiemetic prophylaxis consists of dexamethasone 4mg and ondansetron 4mg and PONV regimen could include any of the following: ondansetron, promethazine, prochlorperazine, or metoclopramide. Despite this regimen, patients undergoing laparoscopic sleeve gastrectomy still experience PONV. This prompted the addition of a more aggressive PONV prophylactic agent to the existing regimen: aprepitant.

The aim of this study was to test the hypothesis that the addition of aprepitant 80mg compared to the standard prophylactic regimen used by Mercy Health- Fairfield Hospital is associated with additional reduction of PONV amongst patients undergoing laparoscopic sleeve gastrectomy compared to those who did not receive apreptant for PONV.

Methods:

Methods: This study is a retrospective chart review of postoperative nausea and vomiting amongst patients who underwent laparoscopic sleeve gastrectomy. The study population includes patients admitted to Mercy Health- Fairfield Hospital between March of 2013 and March of 2017. PONV will be defined as the number of doses of anti-emetics used postoperatively during phase 1 post-anesthesia recovery in the PACU and of emesis at 24 hours and 48 hours postoperative. This accounted for the transport of the patient to the floor. Secondary outcomes being measured include: length of stay and pain scores. Pain was measured by the pain medication received after being admitted to the floor and is reported using Morphine Equivalent Doses.

Results: Results: Data is currently being collected and analyzed. Results and conclusions will be presented at the Ohio Pharmacy Residency Conference.

Conclusions: Conclusions: Data is currently being collected and analyzed. Conclusions will be presented at the Ohio Pharmacy Residency Conference.
Evaluation of a newly implemented amiodarone dosing strategy for the prevention of postoperative atrial fibrillation

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UAN: 0048-0000-18-172-L01-P

Learning Objectives:

1. Review currently available literature assessing strategies used for the prevention of postoperative atrial fibrillation (POAF) in cardiac surgery patients.
2. Discuss the impact of increased amiodarone exposure on rates of postoperative atrial fibrillation and adverse events following coronary artery bypass grafting (CABG).

Purpose:
University of Toledo Medical Center (UTMC) implemented a new amiodarone dosing regimen for the prophylaxis of POAF. The purpose of this study is to determine if the newly implemented POAF prophylaxis regimen significantly decreases the incidence of POAF compared to the hospital’s previous standard of care.

Methods:
We conducted a quasi-experimental, before-after study evaluating the development of POAF in patients who have undergone CABG between 9/1/15 to 5/1/18. Inclusion criteria were age ≥18 years, CABG, and receipt of ≥48 hours of amiodarone postoperatively. Exclusion criteria included atrial fibrillation occurring between hospital admission and date of surgery, resting bradycardia, 2nd or 3rd degree heart block, pre-existing liver dysfunction, interstitial lung disease, pulmonary fibrosis, and use of amiodarone prior to admission. An estimated 200 patients were needed to in the study to attain 20% power to detect an absolute reduction of 10% in POAF rates. Patients are being enrolled into the pre-implementation and post-implementation groups in a 2:1 ratio. The primary endpoint is the proportion patients that developed POAF. Secondary endpoints include rates of adverse effects and hospital length of stay. Data will be collected using a standardized case report form.

Results: One hundred sixty-eight patients have met criteria for inclusion in the study; 137 patients in the pre-intervention arm and 31 patients in the post-intervention arm. The proportion of patients who developed POAF was not significantly different between the pre-intervention versus the post-intervention groups (29.9% vs. 34.6%, p=0.635). No differences were observed in hospital length of stay, rates of amiodarone discontinuation, bradycardia, or liver dysfunction between groups.

Conclusions: Preliminary analysis has not found a difference between the two amiodarone dosing strategies. Completed results will be presented at Ohio Pharmacy Resident Conference.
Discontinuation of Proton Pump Inhibitors in Patients with Chronic Kidney Disease

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Christopher Lacey, PharmD, BCPS, Niraj Desai, MD, Danielle Cooney,PharmD, BC-ADM

Learning Objectives:

1. Review the association between proton pump inhibitors with chronic kidney disease and end-stage renal disease
2. Discuss the impact of discontinuing or continuing proton pump inhibitors on the change in renal function in patients with established chronic kidney disease

Purpose:
Proton pump inhibitors (PPIs) have recently been linked to serious complications, such as chronic kidney disease (CKD) and end stage renal disease (ESRD). However, there is insufficient evidence to support if stopping PPIs can help mitigate these serious adverse outcomes. The objective of this study is to determine if discontinuing PPIs in patients with established CKD slows the decline in renal function compared to those continued.

Methods:
This retrospective evaluation consists of 2 groups, a continuous PPI group and a discontinued PPI group. The primary endpoint is the change in eGFR. Patients eligible for inclusion were those with established CKD and on a PPI from January 1, 2014 to December 31, 2015, with a mean possession ratio (MPR) of ≥ 70%. Patients on dialysis at baseline were excluded. We targeted an enrollment of 100 who discontinue their PPI between January 1, 2015 to December 31, 2015 for at least 180 consecutive days and 100 patients with continuous PPI use between January 1, 2015 to December 31, 2015 with an MPR ≥70%. Baseline eGFR data will be compared to final eGFR data after at least 6 months of discontinuation or continuation of a PPI. We hypothesized, during study design, that patients with CKD exposed to at least one year of PPI followed by discontinuation will exhibit slower decline in renal function (measured by eGFR) compared to CKD patients continuously exposed to a PPI.

Results: Will be presented at the Ohio Pharmacy Resident Conference

Conclusions: Will be presented at the Ohio Pharmacy Resident Conference
Learning Objectives:

1. Describe the impact of optimal glycemic control in critically ill patients
2. Discuss guideline recommendations for glycemic control in critical care

Purpose:
Hyperglycemia is common in critically ill patients. It is associated with an increased risk of infection and mortality among patients admitted to the intensive care unit. The purpose of this study is to evaluate the impact of pharmacist managed glycemic control within the intensive care unit (ICU) at Mercy Medical Center (MMC).

Methods:
This study was a prospective analysis with a retrospective cohort for comparison. The prospective phase was conducted during October 2017. During this phase management of glycemic control was initiated and monitored by a pharmacist. This included initiation and adjustment of insulin therapy and blood glucose monitoring throughout the patient’s ICU stay. Initiation of insulin infusion and subcutaneous basal-bolus regimens were based on a pharmacy driven hyperglycemic protocol at MMC. Data from these interventions was collected and compared to a retrospective cohort. The patient data for the retrospective cohort was collected from October 2016 and screened for the same inclusion and exclusion criteria. Inclusion criteria were all hyperglycemic ICU patients over 18 years of age that were admitted to the Unity Health Network service at MMC. The primary outcome is the percentage of blood glucose readings within the range of 70-180 mg/dL. Secondary outcomes will include number of blood glucose readings >180 mg/dL, number of blood glucose readings

Results: Data collection is currently underway. Final results will be presented at OPRC.

Conclusions: Final conclusions will be presented at OPRC.
Assessing the impact of pharmacy resident interventions on hospital medication costs

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UAN: 0048-0000-18-175-L04-P

Learning Objectives:

1. Identify ways in which pharmacy residents have a positive financial impact on patient outcomes and healthcare expenditure
2. Discuss the value of different interventions performed by pharmacy residents in an inpatient setting

Purpose:
Pharmacy resident interventions are associated with reductions in length of stay, readmission rates, and medication costs. Pharmacoeconomic analyses show a positive benefit-cost ratio for pharmacy residency programs; thus, investment in a pharmacy residency program is justified by the financial return from resident interventions. The objective of this study is to determine the impact of pharmacy resident participation in clinical services on institutional and patient medication costs.

Methods:
This is a retrospective cohort of patients admitted to the University of Toledo Medical Center from July 2012 to June 2017. Subjects are grouped according to admission during months wherein residents participate in or are absent from clinical services (rounding or non-rounding months, respectively). To determine if pharmacy residents’ presence has a significant impact on medication costs, a student’s t-test will be conducted to compare averages for each endpoint. Acquisition costs and patient charges are extracted from internal billing software. To evaluate the impact of the number of residents participating in clinical services, average medication costs to the institution will be compared between months with established numbers of residents rounding using a one-way ANOVA.

Results: Preliminary results indicate there is no significant difference between average medication cost to the institution or patient per discharge during rounding months compared to non-rounding months. A one-way ANOVA indicates the number of residents participating in clinical services has a significant impact on medication costs to the institution.

Conclusions: The presence of pharmacy residents on clinical services is associated with a modest reduction in average institutional and patient medication costs per discharge. The number of residents participating in clinical services has a significant impact on average institutional medication cost per discharge. Further studies are needed to investigate relationships between specific resident interventions and patient populations, as well as capture the impact of short- and long-term cost-saving interventions.
Retrospective review of anticoagulant use in cancer patients: Direct oral anticoagulants versus vitamin K antagonist

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UAN: 0048-0000-18-176-L01-P

Learning Objectives:

1. Describe the complications of anticoagulant selection in cancer patients.
2. Discuss the safety and efficacy of using DOACs in cancer patients.

Purpose:
Patients with malignancy are known to be in a hypercoaguable state which predisposes these individuals to venous thromboembolism (VTE). Guidelines state that low molecular weight heparin (LMWH) is the preferred agent over vitamin K antagonist (VKA) therapy and direct oral anticoagulant (DOAC). While LMWH is currently the preferred agent, it often is not the most practical option for patients. The National Comprehensive Cancer Network (NCCN) recommends that DOACs can be used over LMWH if the patient cannot tolerate, afford or chooses against LMWH. However, there is a lack of literature regarding the use of DOACs in patients with active malignancy and more research is needed. The objective of this study is to determine the efficacy and safety of DOACs versus VKA therapy in patients with cancer.

Methods:
This was a retrospective chart review of patients from July to November 2017 with a diagnosis for active malignancy receiving oral anticoagulation. 1519 patients were screened through the inpatient and emergency department electronic medical records using diagnosis codes for cancer. Patients not receiving oral anticoagulation prior to hospital presentation were excluded. Primary outcomes were the occurrence of VTE, bleeding and death.

Results: A total of 91 patients were included, 44 in the DOAC and 47 in the VKA group. VTE occurred in 4 DOAC versus 3 VKA patients (9.1 vs 6.4%; P=0.628). Bleeding occurred in 8 DOAC versus 6 VKA patients (18.2 vs 12.8%; P=0.474). Bleeding was explained by anticoagulants in 2 DOAC patients and 3 VKA patients. Mortality occurred in 2 DOAC patients versus 5 VKA patients (1 directly related to bleeding).

Conclusions: There was no statistically significant difference between DOACs and VKA therapy in either VTE or bleeding rates. Further studies need to be conducted allowing a larger sample size.
Correction of Hypokalemia Through Potassium Supplementation

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UAN: 0048-0000-18-177-L01-P

Learning Objectives:

1. Identify the degree of potassium deficiency based on serum levels
2. List medications and clinical conditions that can cause significant changes in serum potassium levels

Purpose:
Hypokalemia, defined as serum concentration < 3.5 mmol/L, affects more than 20% of hospitalized patients, and causes serious adverse effects including arrhythmias. Correction of hypokalemia should be protocol driven; however, there is no precise correlation between potassium supplementation and serum potassium levels. This study will assess the effects of potassium replacement therapy on serum levels in patients with hypokalemia.

Methods:
A retrospective study was performed including patients 18 – 89 years of age with potassium concentration < 3.5 mmol/L and a corresponding serum creatinine (SCr) and magnesium within 12 hours. Patients receiving potassium replacement must have had a repeat serum potassium > 2 hours after administration. Patients were excluded if they were pregnant, had a hemolyzed potassium sample, hypokalemia within 24 hours of admission, required renal replacement therapy, or had an admission diagnosis of diabetic ketoacidosis or hyperosmolar hyperosmotic state. An initial result of hypokalemia served as the index result. After the index result, the dose of potassium replacement was determined. Following administration of potassium replacement, a final potassium result was determined. A forward, stepwise, logistic regression analysis of achieving serum potassium ≥ 3.7 mmol/L was conducted to determine the effect of potassium dose, SCr, magnesium, medications, and clinical conditions on change in serum potassium levels.

Results: Of patients admitted on April 11th, 2017, there were 215 hypokalemia observations that met inclusion criteria. The mean index result was 3.2 mmol/L (±0.3 mmol). Replacement occurred in 152/215 (70.7%) of observations, with a mean replacement dose of 33.7 mEq (±24.5 mEq). Of the observations receiving potassium replacement, 63/152 (41.4%) achieved serum potassium ≥ 3.7 mmol/L. When potassium replacement did not occur (63/215; 29.3%), serum potassium ≥ 3.7 mmol/L was achieved in 39.7% of observations. Final results and conclusion will be presented at the Ohio Pharmacy Residency Conference.

Conclusions: Final conclusions will be presented at the Ohio Pharmacy Residency Conference.
**Evaluation of the Impact of a Pharmacist-led Medication Management Program in Patients with Diabetes**

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Lauryl Hanf-Kristufek, PharmD, BCPS, CACP

UAN: 0048-0000-18-178-L04-P

**Learning Objectives:**

1. Evaluate the impact of a pharmacist-led medication management program on glycemic control, determined by Hemoglobin A1c, in patients with diabetes over a 6-month period
2. Analyze the impact of pharmacist intervention on Emergency Department visits, annual eye exams, and annual foot exams

**Purpose:**
Diabetes continues to be a major health concern for individuals and society due to the high physiologic and economic burden brought on by its complications. Despite new medications and specific care for patients with diabetes, control of the disease remains largely insufficient. Growing evidence indicates that diabetes care provided by a pharmacist is effective in improving treatment outcomes, mainly because of the ability to dedicate time and expertise to providing comprehensive medication review. Implementation of a pharmacist-led diabetes medication management program at Mercy Health-St. Charles may help patients understand and control their disease state, thus improving overall glycemic control.

**Methods:**
This study was approved by the Institutional Review Board on October 5, 2017. Patients 18-90 years of age with diabetes will be referred to Mercy Health-St. Charles Medication Management Services to meet with a pharmacist for an initial office visit, as well as 3 and 6 month follow up visits. In addition, interval appointments may be scheduled on a case by case basis. The pharmacist will obtain patient information, past medical history, vital signs, labs, and perform a comprehensive medication review. The pharmacist will provide diabetic education, medication management based off of validated algorithms, and dietary referrals as appropriate. The primary objective is to evaluate the impact of a pharmacist-led medication management program on glycemic control, determined by Hemoglobin A1c, in patients with diabetes over a 6-month period. Secondary objectives include analyzing the impact of pharmacist intervention on Emergency Department visits, annual eye exams, and annual foot exams.

**Results:** Results are currently pending as the project is anticipated to be completed Spring 2018.

**Conclusions:** Conclusions pending until results are completed.
Risk factors associated with bleeding and/or thrombotic events in patients receiving triple therapy

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Denise Sutter, PharmD, BCPS, Elizabeth A. Petrovitch, PharmD, BCPS, Claudia Hanni, PharmD, Raymond Yost, PharmD

UAN: 0048-0000-18-179-L01-P

Learning Objectives:

1. Discuss the safety and efficacy of anticoagulation and antiplatelet regimens in triple therapy
2. Identify risk factors associated with bleeding and/or thrombosis in patients receiving triple therapy

Purpose:
Triple therapy is defined as dual antiplatelet therapy (DAPT) combined with an oral anticoagulant. It prevents thrombosis in patients with indications for both DAPT and anticoagulation, however, increases bleeding risk compared to DAPT or anticoagulation alone. Efficacy is similar between direct oral anticoagulants (DOACs) and warfarin in the absence of DAPT, but DOACs have a lower risk of major bleeding. There are known risk factors associated with bleeding and thrombosis in patients on DAPT or anticoagulation, however, the risks are unknown when combined. We aim to define risk factors associated with bleeding and/or thrombotic events for patients on triple therapy.

Methods:
This retrospective subgroup analysis will analyze patients initiated on triple therapy between January 2013 and December 2015. A database developed by the Southeastern Michigan Anticoagulation Pharmacy Research collaborators includes 1,348 individuals who were initiated and discharged on triple therapy during a hospital admission. The database includes patients between the ages of 18-89 and excludes individuals if pregnant, on triple therapy before their admission, or expected to be on anticoagulation therapy for less than or equal to 45 days. This substudy will analyze the risk factors of individuals with an outcome of thrombosis or bleed within six months of triple therapy initiation. A backwards stepwise logistic regression model will be used to compare bleeding and thrombotic events, time to any event and mortality between warfarin combinations and DOAC combinations. Analyzed risk factors will include agents and doses prescribed, the indications for both DAPT and anticoagulation, patient age, gender, comorbidities, and serum platelet, hemoglobin and creatinine levels. CHA2DS2-VASC score, HAS-BLED score, and thrombotic and/or bleed severity will also be collected through chart review.

Results: Results (preliminary): Among the 599 patients included from the Detroit Medical Center, 247 individuals received a DOAC and 352 received warfarin. Further analysis is in progress.

Conclusions: N/A
Evaluation of antibiotic prescribing for urinary tract infection in the emergency department: A retrospective chart review

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UAN: 0048-0000-18-180-L01-P

Learning Objectives:

1. Review current literature regarding antibiotic prescribing for urinary tract infections (UTI’s) in the emergency department (ED)
2. Explain importance of pharmacists’ role in antimicrobial stewardship (ASP) in the ED

Purpose:
Approximately 20-30% of antibiotics prescribed in acute care hospitals are either unnecessary or inappropriate. This may contribute to the healthcare problem of increasing antimicrobial resistance. UTI’s are among the three most commonly treated infections in the acute care setting. Therefore, assessing appropriateness of antibiotic prescribing for UTI’s is vital for ASP. The objective of this study is to evaluate antibiotic prescribing for UTI’s in the ED and identify potential quality improvement measures to enhance prescribing. The primary objective is the evaluation of number of days of inappropriate antibiotic therapy prescribed. Secondary objectives include assessment of the percentage of appropriate antibiotic dose, frequency, and duration of therapy, and correlation of urine analysis (UA) components with prescribing patterns.

Methods:
This is a retrospective chart review over a 3-month period of patients with diagnosed UTI discharged from the ED on antibiotics. Data was collected through the electronic medical record and documented in a secure password protected system. Adult female patients discharged from the emergency department with antibiotics for a UTI were included in this study. Patients who were admitted to the hospital, discharged on antibiotics for multiple indications, or had catheter- associated UTI were excluded. Infectious Disease Society of America (IDSA) Guidelines for Asymptomatic Bacteriuria and Acute Cystitis and Pyelonephritis were utilized to define appropriateness of therapy. Data collection parameters included sex, age, allergies, ICD-9 diagnosis, symptoms, UA, antibiotic name, dose, duration, frequency, sexually transmitted infection test results, and urine culture results.

Results: Preliminary results showed average duration of antibiotic therapy was approximately 7 days. Additionally, 30/120 patients analyzed met asymptomatic criteria and 96% received antibiotics inappropriately.

Conclusions: Data is currently being analyzed. Final results and conclusions will be presented at the Ohio Pharmacy Residency Conference.
Assessing Latent Tuberculosis Treatment and Identifying Barriers in a Medically Underserved Population

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UAN: 0048-0000-18-181-L01-P

Learning Objectives:

1. Recognize the importance of latent tuberculosis infection (LTBI) treatment as a public health concern.
2. Explain the role of the pharmacist in identifying and reducing barriers to LTBI treatment at a Federally Qualified Health Center (FQHC).

Purpose:
This study aims to use a standardized method to determine whether patients with LTBI at Heart of Ohio Family Health Centers (HOFHC) have received and completed treatment and identify whether those who have not completed therapy are candidates for treatment. HOFHC is a network of two FQHCs in Columbus, Ohio that serves a large immigrant and refugee population. The purpose of this study is to identify patients with LTBI, determine whether or not patients have been treated, identify patients who may be candidates for treatment, report barriers to treatment in this patient population, and discuss the role of the pharmacist in LTBI management.

Methods:
A report from the electronic health record was used to identify patients who have a diagnosis of LTBI between July 2016 and December 2017. Patients ≥ 18 years of age with a diagnosis of LTBI were included. Those with a diagnosis of active tuberculosis were excluded. For patients included in the study, charts were reviewed to determine whether therapy completion was documented. If there was no documentation of therapy completion, in-person surveys were conducted to assess if patients were prescribed and were adherent to a LTBI treatment regimen. Additional questions assessed baseline understanding of the condition and its treatment. Patients determined to be candidates for treatment were discussed with providers.

Results: Of 255 patients identified through retrospective chart review, 126 met criteria for study inclusion. Twenty-nine patients had documented completion of LTBI therapy, and 97 were candidates for interview. The results of this study are in progress.

Conclusions: Ultimately, findings will aid in understanding the prevalence of untreated LTBI in the clinics’ patient population, as well as identify gaps in care that a pharmacist can fill in assessing and managing LTBI.
Cost efficacy analysis of pharmacist-led diabetes management in a primary care clinic

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Learning Objectives:

1. Review the background literature related to cost effectiveness of pharmacist services
2. Explain the cost benefit of pharmacist-led disease state management in primary care clinics.

Purpose:
Due to the shortage of primary care providers (PCPs) and increased focus on quality metrics, ambulatory care pharmacists (ACPs) have intervened to provide diabetes (DM) management under collaborative practice agreements resulting in improved patient outcomes. The primary objective of this study is to determine the cost effectiveness of utilizing an ACP for DM management. The secondary objectives include change in hemoglobin A1c (HbA1c) after one year, estimating revenue for services rendered from clinical pharmacists’ services, rate of all cause emergency department (ED) visits and DM-related hospitalizations.

Methods:
This is a retrospective, multi-site cohort study of 406 diabetic patients, &gt;18 years of age, with a HbA1c &gt;8%, receiving primary care services within an academic health system between May 2015 and March 2018. In group A, the PCP + endocrinology managed patient’s DM compared to group B, where it was managed by PCP + APC + endocrinology.

Results: Group A included 266 and group B included 140 patients. Preliminary results include baseline duration of DM 6.6 v. 12.2 years (p=0.0001) and baseline HbA1c of 9.8% v. 10.6% (p=0.0002). The ACP resulted in a cost of $128 for each additional HbA1c percent lowered; however, when factoring ED visits the result was a net savings of $179 per patient per HbA1c. The cost associated with moving one additional patient with HbA1c &gt;9% to HbA1c

Conclusions: These results support the use of ACPs for DM management for clinical outcomes, and cost savings to the healthcare system.
Evaluation of pharmacist-led transition of care for warfarin management

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Learning Objectives:

1. Discuss the implementation of pharmacist led counseling during transition of care
2. Describe the impact of pharmacist led counseling on the prevention of inappropriate anticoagulation

Purpose:
The transition from inpatient to outpatient care is a vulnerable time for patients recently started on warfarin therapy. Dosing errors, insufficient monitoring, and medication non-adherence occur during this time. Implementing pharmacist-led transition of care counseling prior to discharge can help to prevent inappropriate anticoagulation. This study evaluated the effectiveness of transition of care before and after implementing pharmacist-led counseling.

Methods:
In an anticoagulation clinic at a tertiary medical center, patients were evaluated prior to and after the implementation of pharmacist-led counseling. Patients admitted to the hospital, newly initiated on warfarin, and referred by vascular physicians were included. The primary outcomes were the rate of discrepancies regarding anticoagulation therapy found at the first outpatient visit and the average time between the referral and the first contact with the patient. The secondary outcome was the rate of hospital readmission due to clotting or bleeding within 30 days after discharge.

Results: A total of 64 patients were included in this study; 49 in the pre-intervention group and 15 in the post-intervention group. The rate of discrepancies in the pre-intervention and post-intervention groups were 38.8% and 13.3%, respectively (p = 0.059). The average time between the referral and first contact with patients was 53.47 hours ± 47.1 before pharmacist-led counseling was implemented and 25.23 hours ± 32.73 after the intervention of pharmacist-led counseling (p < 0.05). The rate of readmission within 30 days in the pre-intervention group and post-intervention group were 0% and 6.7%, respectively (p = 0.234).

Conclusions: Pharmacist led transition of care counseling prior to discharge for patients newly initiated on warfarin decreases the rate of warfarin discrepancies seen at the first outpatient INR appointment, and decreases the time patients go without contact with a pharmacist regarding their warfarin therapy.
Comparison of outcomes of benzodiazepine users versus non-users in adults with community acquired pneumonia (COBRA-CAI)

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Learning Objectives:
1. Describe benzodiazepine action and associated immune suppression effects
2. Evaluate the methods of the study presented
3. Detail preliminary results
4. Discuss current findings and future direction of study

Purpose:
In recent research, benzodiazepines, along with non-benzodiazepines, have been associated with increased risk of hospitalization for pneumonia. This risk is thought to be attributed to benzodiazepine-induced immunosuppressive and microaspiration effects. Though such studies correlated risk with benzodiazepines and incidence of pneumonia, the outcomes of benzodiazepine users versus non-users treated for community-acquired pneumonia has yet to be elucidated. This study will seek to establish the correlation between use of benzodiazepines or non-benzodiazepines and outcomes in adult patients with community acquired pneumonia.

Methods:
A retrospective chart review encompassing the dates of 01/01/2011 to 12/31/16 will be performed. All information and records will be gathered from a large, integrated health system and will be inclusive of individuals ≥ 18 years of age who have received a benzodiazepine or non-benzodiazepine upon admission diagnosed with pneumonia via chest x-ray and ICD 9/10 codes. Exclusion criteria include patients with chronic immune suppression, acute exacerbation of heart failure, admission to the intensive care unit (ICU), acute pulmonary embolism, taking an antipsychotic medication, intubation, mechanical ventilation, chest tube or pneumothorax, and antimicrobial use within the past 30 days. The primary objective is a composite of the following outcomes: antibiotic dose escalation at 48 hours, transfer to ICU at 48 hours, increased oxygen requirements at 48 hours, and readmission for pneumonia within 30 days. Secondary objectives include individual components of the primary outcomes as well as length of stay, clinical decompensation after 48 hours [defined as any 2 of the following: respiratory rate &gt; 22 respirations per minute (RPM), heart rate &gt; 100 beats per minute (BPM), temperature &gt; 37.9 C, and systolic blood pressure &lt; 100 mmHg], and all cause 30 and 90 day readmission. Collection of baseline characteristics include patient demographics, chronic kidney disease, indication for benzodiazepine, duration of benzodiazepine exposure, Charlson comorbidity score, previous pneumonia events within one year prior to index date, diagnosis of alcoholism, current smoking status, underlying lung disease, and antibiotic utilization. Nominal data will be evaluated using a Chi-Square test and continuous data will be evaluated with a student’s-t-test.

Results: Preliminary results will be reported during the OPRC presentation.

Conclusions: Awaiting further data collection and analysis to meet power and draw conclusion from overall study.
Discontinuation rates of dolutegravir in U.S. outpatient HIV clinic

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Learning Objectives:

1. Evaluate current literature surrounding discontinuation rates of dolutegravir
2. Describe risk facts for dolutegravir discontinuation

Purpose:
Dolutegravir is an integrase strand inhibitor (INSTI) used in combination with other antiretrovirals as a first line treatment of HIV. Recent European studies evaluating dolutegravir have reported higher incidences of discontinuation than were reported in clinical trials. The main reason reported for discontinuation of dolutegravir were neuropsychiatric side effects. Risk factors identified for dolutegravir discontinuation include regimens containing abacavir, age over 60 years, and female gender. The primary objective of this study is to determine the incidence of discontinuation of dolutegravir compared to other INSTI-based regimens. Secondary objectives include determining risk factors for dolutegravir discontinuation and determining the incidence of other post-marketing side effects such as weight gain compared to other INSTI-based regimens.

Methods:
This is a retrospective chart review of patients 18 years or older receiving care at the University of Toledo Medical Center Ryan White Clinic, who were initiated or changed to an INSTI-based antiretroviral regimen from January 2010 to September 2017. The regimens evaluated consisted of an INSTI (dolutegravir, elvitegravir, or raltegravir) combined with one of the following nucleoside reverse transcriptase inhibitor backbones: tenofovir disoproxil fumarate/emtricitabine, tenofovir alafenamide/emtricitabine, or abacavir/lamivudine. Electronic medical records were used to assess for discontinuation rates, reasons for discontinuation, and changes in weight during the first calendar year after initiation of the INSTI-based regimen. Additional information collected include demographics, concurrent medications, viral load and CD4 counts at the time of INSTI-based regimen and at 1 year follow up, prior HIV regimens if applicable, and HLA-B5701 status.

Results: Data collection and analysis are currently being conducted.

Conclusions: Results and conclusions will be presented at the 2018 Ohio Pharmacy Residency Conference.
Rheumatoid Arthritis: Guideline directed medication therapy patterns review.

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Learning Objectives:

1. Review the basic step therapy recommendations from the 2015 American College of Rheumatology Rheumatoid Arthritis Guidelines.
2. Describe the general recommended safety monitoring for specialty rheumatoid arthritis medications.

Purpose:
The purpose of this study was to review the patterns of guideline-directed medication therapy in rheumatoid arthritis patients that utilize an in-clinic specialty pharmacy at an academic medical center. This study assessed whether patients received recommended lab and disease state monitoring. Additionally, analysis was performed on the rates of switching between specialty medications.

Methods:
This research was approved by the academic medical center’s Internal Review Board for human subjects research. This study is a retrospective chart review that reviewed patient records documented in the academic medical center’s outpatient EMR. The patient’s index specialty medication was identified for the period of one fiscal year of the Specialty Pharmacy: 07/01/2016 through 06/30/2017. Patient information was reviewed for one year prior to the index medication prescription date. Included patients were 18 years of age or older, had a diagnosis of rheumatoid arthritis, had rheumatology visit data for at least one year, and had an index specialty medication prescription within the study period. Rheumatology visits, laboratory monitoring data, phone notes, and medication history were collected from the EMR.

Results: Fifty-seven patients were included in the final analysis. All 57 had progressed through appropriate step therapy based on 2015 American College of Rheumatology (ACR) guidelines. 40% of patients that had started an index specialty medication had received all of the appropriate guideline/package insert recommended safety monitoring, and only 42 (73.6%) had received a TB test. Additionally, a Disease Activity Scale was only documented in the EMR for 20 (35.1%) of patients. Lastly, only 5 (20%) of 25 patients on chronic steroids had a documented steroid use plan.

Conclusions: There are opportunities for increasing the number of patients that are receiving all recommended safety monitoring, receiving documented disease activity scale assessments, and with documented chronic steroid use plans.
Effects of Calcium Replacement on Ionized Calcium Levels in Surgical Intensive Care Unit Patients

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Learning Objectives:

1. Describe complications of hypocalcemia
2. Choose an appropriate calcium dose based on ionized calcium level

Purpose:
Hypocalcemia in the surgical intensive care units (SICU) has been associated with increased mortality and longer ICU stay. There is a paucity of literature to guide adequate calcium replacement in hypocalcemic patients. The purpose of this study is to evaluate the association between IV calcium dose(s) and the corresponding ionized calcium (iCa) levels.

Methods:
This is a single center, retrospective cohort study in adult patients with hypocalcemia admitted to the SICU between January 2010 and December 2017. Patients were included if they had an iCa < 1.13 mmol/L and received IV calcium therapy. Patients were excluded if they were pregnant, had hypo or hyperparathyroidism, or if they were receiving plasmapheresis, total parenteral nutrition therapy, or renal replacement therapy. The primary objective of this study was to evaluate the association between the IV doses of calcium and the iCa levels. The secondary objectives were to determine average IV calcium dose required to normalize iCa levels and to evaluate the association between blood products administered and iCa levels. Lastly, adverse effects and SICU length of stay was assessed. Descriptive statistics will be used to describe the cohort. Linear regression will be used for the analysis of the primary objective.

Results: Data is currently being analyzed, results will be presented at the Ohio Pharmacy Residency Conference.

Conclusions: Data is currently being analyzed, conclusions will be presented at the Ohio Pharmacy Residency Conference.
Comparison of short-course versus prolonged-course antimicrobial therapy in the management of intra-abdominal infections

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Learning Objectives:

1. Review the Infectious Diseases Society of America guideline recommendations of antimicrobial treatment duration for intra-abdominal infections
2. Discuss the rationale for longer durations of therapy when treating intra-abdominal infections

Purpose:
The current Infectious Diseases Society of America guideline (IDSA) recommendations for intra-abdominal infections (IAI) recommend an antimicrobial treatment duration of 4 to 7 days. Although recent evidence supports this shorter course of therapy, antimicrobials are often administered for 10 to 14 days due to concern for subsequent complications. This study aimed to determine the clinical outcomes of short-course versus prolonged-course antimicrobial treatment of IAI in the inpatient setting.

Methods:
This was an institutional review board approved single-center, retrospective cohort study. Included patients were admitted with IAI, received antimicrobials for ≥ 48 hours, and had at least one sign of IAI. Patients with concomitant infections at sites other than the abdomen, primary peritonitis or pancreatitis, immunocompromising conditions, or bacteremia were excluded. The primary outcome of clinical cure was compared between the short-course (≤ 7 days of antimicrobial treatment) and the prolonged-course (> 7 days) groups. Secondary outcomes included hospital length of stay (LOS), ICU LOS, 28-day all-cause mortality, and 30-day readmission.

Results: A total of 175 patients were included, of which 73 received short-course and 102 received prolonged-course antimicrobials. Baseline characteristics were similar between groups. Clinical cure occurred at a similar rate between the short-course and prolonged-course groups (74.0% vs. 67.6%, p=0.367). Secondary outcomes including hospital LOS (5.5 days vs. 5.8 days, p=0.372), ICU LOS (3.0 days vs. 5.0 days, p=0.117), 28-day all-cause mortality (4.1% vs. 2.0%, p=0.651), and 30-day readmission (19.2% vs. 20.6%, p=0.818) were also not significantly different.

Conclusions: In patients with IAI, outcomes observed with short-course antimicrobial treatment were similar to those in the prolonged-course group. These results further support a shorter duration of therapy for patients with IAI.
Impact of clinical pharmacist interventions on readmission rates of hospitalized patients with heart failure

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UAN: 0048-0000-18-189-L04-P

Learning Objectives:

1. Explain the purpose of the Hospital Readmissions Reduction Program
2. Recognize the different patient-pharmacist interactions that can improve Transitions of Care

Purpose:
Heart failure (HF) is one of the leading causes of morbidity and mortality in the United States (US). Projections show that by 2030, the prevalence of HF in the US will increase by 46% with the average cost increasing to 69.7 billion dollars. The high prevalence and costs associated with HF has led to financial reimbursement penalties for hospitals with a higher than expected 30-day HF readmission rate. Alliance Community Hospital’s HF readmission rate is 22.1%. The objective of this project is to evaluate the impact of a pharmacy driven intervention bundle has on 30-day readmission rates for patients with HF in a small community hospital.

Methods:
Between November 1, 2017 and February 28, 2018 patients with a diagnosis of HF, who met inclusion criteria, received the following: admission medication reconciliation with a focus on identifying HF medication related problems combined with disease and medication education; HF disease state and medication counseling prior to discharge; and follow-up phone calls at 2-3 days, 7-10 days, and approximately 30 days post discharge. The Minnesota Living with HF Questionnaire was administered upon admission and during the final phone call to assess symptoms. The phone calls focused on physician follow-up, medication accessibility, and symptom management. A retrospective chart review will be performed to determine if pharmacists are effective in reducing readmission rates.

Results: Preliminary results show a HF readmission rate of 13.51% for enrolled patients. Complete data analysis will be presented at the conference.

Conclusions: A full time clinical pharmacist position was approved as a result of this project. Conclusions will be presented at the conference.
Relationship between inpatient antimicrobial treatment for pneumonia and 30-day readmission rates

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Learning Objectives:
1. Discuss the effect of hospital readmissions secondary to an inpatient pneumonia diagnosis
2. Review current guidelines for treatment of community- and hospital-acquired pneumonia
3. Describe impact of antimicrobial stewardship on readmission rates for pneumonia

Purpose:
Nationally, 1 in 5 patients admitted to the hospital for pneumonia will be readmitted in 30 days. Elevated pneumonia readmission rates affect patients’ quality of life and have a financial impact on hospitals, notably since the establishment of the Hospital Readmission Reduction Program in 2012. This program requires Centers for Medicare and Medicaid Services (CMS) to reduce payments to hospitals with excess readmission ratios in certain disease states, including pneumonia. Few studies assess whether antimicrobial stewardship impacts readmission rates, and the results of such studies are varied.

Methods:
This was a single-center, retrospective, case-control study. Patients who were admitted to The Jewish Hospital between September 1, 2015, and August 31, 2017, and had a diagnosis of community-acquired pneumonia (CAP) or hospital-acquired pneumonia (HAP) were included. Controls were defined as patients whose antimicrobial therapy was appropriate based on Infectious Diseases Society of America (IDSA) guidelines, and cases were defined as patients whose antimicrobial therapy was inappropriate. The study objective was to evaluate the relationship between antimicrobial selection and readmission rates for patients treated in the hospital with a diagnosis of CAP or HAP. The primary outcome was the 30-day readmission rate, and secondary outcomes were length of stay of the initial hospitalization and readmission diagnoses.

Results: Of the 309 patients included in the study, there were 165 controls, 11 of which were readmitted (6.7%), and 144 cases, 61 of which were readmitted (42.4%). Average length of stay was shorter for CAP controls compared to cases (4.5 vs. 5.4 days, respectively) and was longer for HAP controls compared to cases (9.2 days vs. 4.8 days, respectively). The most common readmission diagnosis was pneumonia, which occurred more frequently in the case group.

Conclusions: Increased appropriateness of antibiotic selection and duration for community- and hospital-acquired pneumonia correlates with decreased readmission rates.
Innovative learning in pharmacy practice: The perceived benefits and barriers to a layered learning practice model

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Learning Objectives:

1. Identify the actual or perceived benefits to having a layered learning practice model in an experiential practice site
2. Identify the actual or perceived barriers to having a layered learning practice model in an experiential practice site

Purpose:
The objective of this study was to determine pharmacists’ perceived benefits of and barriers to implementing a layered learning practice model (LLPM) in a pharmacy practice setting.

Methods:
To assess benefits and barriers of layered learning, an online survey was created using QualtricsTM software and sent to experiential directors at all Big Ten and Ohio Colleges of Pharmacy. The experiential directors and residency program directors were asked to send the email to all preceptors affiliated with their program. The survey assessed the perceived or actual benefits of and barriers to the layered learning model. Benefits and barriers to patient care, student or resident learning, and the practice site were assessed. Variation in the type of benefits and barriers, based on practice setting, were also assessed. Results were analyzed using descriptive and inferential statistics.

Results: In total, 305 surveys were initiated by precepting pharmacists. Survey respondents reported precepting IPPE students (n = 113, 52%), APPE students (n = 113, 52%), and residents (n = 176, 81.1%) throughout a given year. A total of 148 (68.2%) respondents reported having multiple pharmacy learners at their site at some point in a given year. Survey respondents indicated the most important benefits of a LLPM include an increase in patient access to pharmacy team members (n=95, 43.7%), an increase in the number of precepting opportunities for learners (n=78, 35.9%), and improvement in patient education (n=74, 34.1%). The top three identified barriers to implementing and maintaining a LLPM include performing precepting duties that may interfere with preceptor job responsibilities (n=157, 72.3%), having inadequate workspace for learners (118, 54.4%), and being unable to effectively teach or oversee multiple learners simultaneously (n=77, 35.5%).

Conclusions: This research provides insight into how a LLPM may benefit a practice site, patient care and training of learners. The compiled results are valuable as targeted approaches can be implemented to address the potential benefits and barriers to a LLPM in pharmacy practice.
Pharmacist-led medication reconciliations in a nurse-led heart failure clinic

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Learning Objectives:

1. Define medication reconciliation
2. Discuss the importance of conducting medication reconciliations

Purpose:
Medication discrepancies affect patient outcomes, increase costs for healthcare institutions, and pose as a healthcare burden. Previous literature has examined utilizing pharmacist-led medication reconciliations and has shown benefit of reducing medication discrepancies at hospital admission and/or discharge. The Joint Commission has incorporated medication reconciliation as a national patient safety goal for ambulatory health. However, there is limited research on pharmacist-led medication reconciliations in the ambulatory setting and in particular, heart failure clinics. Due to heart failure patients requiring multiple medications for control of their disease-state and being a high-risk group for readmissions, it is hypothesized that there are numerous medication discrepancies with this patient population. Therefore, the purpose of this study is to evaluate the number and types of medication discrepancies identified through pharmacist-led medication reconciliations in a nurse-led heart failure clinic.

Methods:
A retrospective chart review was conducted on patients with a diagnosis of heart failure who attended our heart failure clinic from December 12, 2017 to December 27, 2017 and received a medication reconciliation by a pharmacist. Patients were excluded if they were not present at their appointment, did not want to review their medications, or could not recall or discuss their medications. Discrepancies were defined as a disagreement between the ambulatory electronic record and the patient reported medication regimens. The primary outcomes are the number and types of medication discrepancies in the ambulatory EMR including: omissions of prescription medications, omission of OTC/herbal medication, medications patient is no longer taking, incorrect dose of medication, and incorrect frequency of medication. Secondary outcomes will evaluate the discrepancy’s potential for harm, classes of medications involved in the discrepancies, and number and types of medications in the inpatient EMR.

Results: To be presented at conference

Conclusions: To be presented at conference
Emergency Department Management of Acute Pain Crisis in Adults with Sickle Cell Disease

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Learning Objectives:

1. Identify factors that may contribute to acute pain crisis and potential measures to improve emergency department management
2. Define standards or guidelines for emergency department (ED) management of acute pain crisis in adults

Purpose:
The primary objectives of this study are to characterize the medication management and cost impact of adult sickle cell disease patients in the ED for acute pain crisis. Also, to identify whether MetroHealth is meeting the Centers for Medicare and Medicaid (CMS) Inpatient Admission Criteria and time to first analgesic dose benchmarks.

Methods:
This trial is an observational, retrospective, chart review conducted at the MetroHealth System. All sickle cell patients ages 18 years and older seen at any MetroHealth emergency department from January 1, 2017 until June 30, 2017 were included. Data points collected include: number of admissions meeting Centers for Medicare and Medicaid criteria, mean time to first dose of analgesic, number of ED visits, types of interventions made during the encounter, and average visit cost. Descriptive statistics were utilized for the data analysis.

Results: A total of 189 ED encounters and 49 patients were included in the analysis during the 6-month period. 18 patients are considered high utilizers. Only 29 (15%) visits met the 30-minute benchmark for time to first dose of analgesia. Most common reason for ED visit was uncontrollable pain with the use of home medication (98%). 24 patients were considered to have MetroHealth outpatient follow-up. 73% of admissions met CMS inpatient admission criteria. Uncontrolled pain was the admitting cause 97% of the time. Opioids are the mainstay for ED pain treatment (77%). Total hospital charges exceeded $2 million dollars with an average of almost $9,000 per ED encounter.

Conclusions: There is a need to improve time to 1st analgesic dosing for sickle cell pain crisis in the ED. In addition, there is also a need to target high utilizers for development of strategies to provide continuity of outpatient care and development of improved pain management strategies to ensure better resource utilization with outpatient clinic follow up.
CAM-ICU protocol implementation: prevention of delirium and its effect on patient outcomes
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Learning Objectives:
1. Describe the impact of delirium on patient outcomes and the benefits of assessing delirium
2. Determine if implementing a delirium protocol in the ICU will decrease the total number of days that a patient is in the ICU at SRMC

Purpose:
The purpose of this study is to determine if implementing a delirium protocol in the ICU will decrease the total number of days that a patient is in the ICU at SRMC. It is crucial for patients to undergo early detection and treatment for this since delirium is associated with increased time on the ventilator and longer hospital stays. This coincides with increased cost for both the patient and institution, and most importantly; a higher rate of mortality; both in-hospital, as well as after the patient has been discharged. In 2013, The Society of Critical Care Medicine updated the “Clinical Practice Guidelines for the Management of Pain, Agitation, and Delirium in Adult Patients in the Intensive Care Unit” to help establish an outline for protocol that can be used for patients in the ICU. The proposed research does not have any probable risks to the patient. The benefits of this study would be that participants potentially have a shorter length of stay, decreased cost for both patient and institution, and possible decreased risk of mortality in hospital and after discharge.

Methods:
Nurses will be taught about the risks of delirium, prevention, and how to assess for it using CAM-ICU and how to accurately document their findings in Epic, at a minimum once every shift, to keep record of the onset of delirium, interventions implemented, and progression or improvement of delirium. Patient charts prior to implementation of CAM-ICU will be evaluated to establish if delirium was assessed, patients RASS scores were documented, and the average length of stay of patients in ICU. Data will be collected from pre-implementation of the protocol and compare it to the data from post-implementation of protocol to see if assessing delirium in ICU patients have positive outcomes in patients within the institution.

Results:
Data is still being collected and analyzed. Final results will be presented at Ohio Pharmacy Resident Conference

Conclusions:
To be determined after data analysis. Will be presented at Ohio Pharmacy Resident Conference.
Defining the relationship between heroin overdose and length of hospital admissions

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UAN: 0048-0000-18-194-L04-P

Learning Objectives:

3. Recognize heroin overdose data and trends in the state of Ohio, with specific regard for the Toledo region
4. Discuss the implications of the findings of this evaluation with an emphasis on hospital admissions

Purpose:
Heroin has had an overwhelming impact on public welfare and healthcare resources within the state of Ohio. National surveillance data indicate a 21.5% increase in drug overdose deaths in Ohio between 2014-2015. State and local resources have been devoted to curbing the heroin epidemic in the Toledo region, including community education, the distribution of naloxone, and a division of the sheriff’s department targeted at rehabilitation of non-violent drug offenders.

Methods:
This retrospective chart analysis evaluated patients aged 18-89 years presenting to the Mercy Health St. Vincent Medical Center Emergency Department (ED) with confirmed or suspected heroin overdose between January 1st, 2017 – June 30th, 2017. The primary objective of this evaluation was to determine the length of hospital stay. Secondary endpoints include the amount of naloxone administered and necessary interventions. Descriptive statistics were utilized.

Results: One-hundred and one patients were included in this study: 49 presented to the ED and were subsequently admitted, while 52 were evaluated in the ED and discharged. No statistically significant differences in demographic data were identified. The average length of stay for admitted patients was 4.39 days (range, 0-12 days) with a mean of 1.91 days in the ICU and 2.48 days on a general medicine floor. Higher average amounts of naloxone administered prior to presentation were found to be predictive of an ICU admission (6.48 mg vs. 2.43 mg, p=0.0208). The most frequent necessary interventions were central line placement (16/49, 32.7%) and mechanical ventilation (15/49, 30.6%). Seven patients (14.3%) experienced a cardiac arrest within our facility.

Conclusions: Heroin overdoses continue to require emergent life-saving interventions and demand extensive healthcare resources. Investment in strategies for overdose prevention and the subsequent utilization of resources is paramount in curbing the heroin epidemic in Ohio.
Demonstration of the Effects of Perioperative Antibiotic Documentation for Surgical Patients

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UAN: 0048-0000-18-195-L04-P

Learning Objectives:

1. Explain the documentation process for perioperative antibiotics at Summa Health System – Akron Campus on the former and current electronic medication administration record.
2. Describe the consequences of missing antibiotic documentation in the electronic medication administration record.

Purpose:
With a recent transition to a new electronic health record (EHR) Summa Health System – Akron Campus made procedural changes to the documentation of perioperative antibiotic administration. In the new EHR, documentation is manually completed on the electronic medication administration record (eMAR) by a registered nurse in the post anesthesia care unit. The manual process has resulted in a marked decrease in documentation, and consequently charges, as charging occurs upon documentation of administration on the eMAR. This project was completed to describe and quantify the accuracy and consequences of antibiotic administration in the perioperative period.

Methods:
A retrospective review of eMAR and anesthesia documentation was performed for patients who underwent surgery on a weekday from August 1, 2017 through August 18, 2017. The primary endpoint is the number (%) of antibiotic doses given in the operating room (OR) that were not documented on the eMAR. Secondary endpoints include number (%) of antibiotics given in the OR that do not have an order present on the eMAR, number (%) of patients given a post-operative antibiotic, number (%) of post-operative antibiotics that are incorrectly timed, and drug costs lost due to undocumented doses.

Results: A total of 875 surgical cases were evaluated and of these patients, 597 patients were given an antibiotic in the OR. There was no eMAR documentation for 399 of these doses (66.8%). Antibiotics given in the OR without an order present on the eMAR occurred in 159 doses (26.6%), incorrectly timed antibiotics occurred in 49 of 134 post-operative doses (36.6%), and annual estimated pharmacy drug cost loss (not including potential reimbursement) was $43,100.

Conclusions: The results reveal the necessity of antibiotic documentation at the point of care in the OR. The results should be used to gain stakeholder support and explore further options for facilitating documentation in the operating room.
Evaluation of a pharmacy-based telehealth anticoagulation monitoring service at a federally qualified health center

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UAN: 0048-0000-18-196-L04-P

Learning Objectives:

1. Identify one area of pharmacy practice where patient care via telehealth has already been implemented
2. Recognize the unique component of the telehealth anticoagulation monitoring service at AxessPointe Community Health Center

Purpose:
Previous studies have been published describing how pharmacists have been incorporated into telehealth anticoagulation services. However, to date, no research has been conducted analyzing the use of pharmacy technicians in anticoagulation monitoring services. Therefore, the purpose of this project is to implement and evaluate a pharmacist and technician-run anticoagulation monitoring program in a Federally Qualified Health Center (FQHC) with five locations throughout Northeast Ohio.

Methods:
To initiate the service, two of the five FQHCs will participate in the telehealth project. The first site (‘home site’), where the primary clinical and dispensing pharmacy services are located, will be the location where telehealth services are originated by the pharmacy technician. The second site (‘distance site’) is where the pharmacist will be available via real-time video-technology to meet with the patient. Pharmacy technicians will undergo training equipping them to perform point-of-care international normalized ratio testing, collect vital signs and obtain intake information. Providers will select and refer their patients managed on warfarin to the pharmacy anticoagulation monitoring service. Once pharmacy technicians at the ‘home site’ have roomed the patient and obtained necessary information, the pharmacist at the ‘distance site’ will be alerted and teleconferenced. The pharmacist will ask any clarifying questions, provide the patient with dose-related instructions and inform the patient and technician at the ‘home site’ of the appropriate follow-up time frame. The primary endpoint of this study is the difference in time in therapeutic range compared to historical in-person pharmacy anticoagulation monitoring data. Secondary endpoints include changes in visit duration, pharmacist’s time spent per appointment, technician time, and patient satisfaction with the telehealth service.

Results: Data collection and evaluation are currently being conducted.

Conclusions: Data collection and evaluation are currently being conducted.
Learning Objectives:

1. Discuss the potential effect pharmacists’ interventions have on healthcare utilization in an outpatient oncology infusion center
2. Identify strategies that pharmacists can utilize to reduce healthcare utilization in an outpatient setting

Purpose:
The objective of this research project is to determine the impact that pharmacists have on overall healthcare utilization in an outpatient oncology infusion center. The data obtained from this study will highlight the importance of implementing pharmacy services in an outpatient infusion center.

Methods:
This study is an Institutional Review Board approved retrospective, quasi-experimental study of patients receiving care at an outpatient cancer center between the dates of July 2012 to September 2017. The pre-intervention group, from July 2012 to June 2014, consisted of care managed with no pharmacist intervention, including the compounding of chemotherapy. During the post intervention period, from October 2015 to September 2017, a pharmacist was present to oversee order entry, sterile compounding, and patient profile reviews. Patients were selected for inclusion according to the following criteria: outpatients receiving chemotherapy, age 18 years and older, and patients initiated on new chemotherapy or immunotherapy regimens. Patients were excluded based on the following criteria: admitted to the hospital for chemotherapy, pregnant women, and patients receiving non-chemotherapeutic medications. The following data were collected: age, gender, cancer diagnosis, chemotherapy/immunotherapy regimen prescribed, antiemetic regimen prescribed, profile review documentation, and interventions made by a pharmacist. The patients were matched according to age, sex, tumor stage, Eastern Cooperative Oncology Group (ECOG) status, and tumor type (solid versus liquid). The primary endpoint is healthcare utilization defined as 30-day all cause hospital readmission rates. Secondary outcomes include adverse drug reactions or drug interactions as cause for readmission, types of interventions made, and emergency department visits.

Results: Pending, to be presented at OPRC meeting

Conclusions: Pending, to be presented at OPRC meeting
Impact of a pharmacy-based medication reconciliation system at admission to the floor from the emergency department

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UAN: 0048-0000-18-198-L04-P

Learning Objectives:

1. Identify the components of a medication reconciliation
2. Discuss the impact of pharmacists completing medication reconciliation on patients within a hospital setting

Purpose:
Medication reconciliation is a process to decrease medication discrepancies by thorough examination and correction of patients’ medication lists. Pharmacists have proven to be well suited to perform medication reconciliation due to their extensive medication knowledge and ability to identify errors within medication lists along with their communication skills to conduct a productive patient interview. Through pharmacist conducted medication reconciliation prior to admission, a correct home medication list can be used to place orders for the patient while on the hospital floor.

Methods:
Patients who are being admitted to the inpatient floor will have a medication reconciliation completed by a pharmacist or pharmacy student. This intervention will take place in the emergency department (ED) and the clinical pharmacist will be notified through telephone from the ED. Medication reconciliations will also be completed for patients who have already reached the floor due to admission during a time when a pharmacy member was not available. The home medication list will be corrected and recommendations will be made to the provider to correct discrepancies if necessary. The primary outcome will be the number of discrepancies identified through pharmacist intervention and a sub-analysis will be conducted on the type of discrepancies and the average number found per patient. Descriptive statistics will be utilized to analyze the data.

Results: Data is currently being collected and analyzed.

Conclusions: Results and conclusion will be presented at the 2018 Ohio Pharmacy Residency Conference.
Physician Perception of the Role of Community Pharmacists at Comprehensive Primary Care and Comprehensive Primary Care Plus Sites in Ohio

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UAN: 0048-0000-18-199-L04-P

Learning Objectives:

1. Describe how the Comprehensive Primary Care (CPC) and Comprehensive Primary Care Plus (CPC+) initiatives utilize clinical quality measures
2. Discuss the possible role that community pharmacists may play in assisting Ohio CPC and CPC+ sites in meeting these measures

Purpose:
Ohio Comprehensive Primary Care (CPC) and Comprehensive Primary Care Plus (CPC+) are multi-payer initiatives led by the Centers for Medicare and Medicaid Services. These initiatives utilize clinical quality measures as one way to determine whether participating sites are able to receive and keep certain payments. These clinical quality measures differ slightly between the initiatives, but both have a large focus on chronic disease state management. Several studies have shown that involving a pharmacist in chronic disease state management improves health outcomes. The purpose of this study is to determine what opportunities are available for pharmacists to collaborate with physicians at Ohio CPC and CPC+ practice sites. The purpose of this study is to determine what potential opportunities are available for pharmacists to collaborate with physicians at Ohio CPC and CPC+ sites. The findings of the research will provide pharmacists with information on physician perceptions of where and how pharmacists can be most beneficial, as well as provide a better understanding of what changes are already being implemented and where the unfilled needs are at these sites.

Methods:
This cross-sectional, descriptive study utilized a roster of Ohio-licensed physicians obtained from the State Medical Board of Ohio in order to contact potential study participants. A Qualtrics survey was sent to all physicians with listed email addresses (44,494 physicians). Respondents self-screened in order to ensure that only physicians at Ohio CPC and CPC+ sites completed the survey. The survey questions consisted of 5-point Likert rating (1 = Strongly agree to 5 = Strongly disagree), rank order scaling, dichotomous, and multiple-choice questions. Participants had 4 weeks to complete the survey, and non-responders received weekly reminders via email until they completed the survey, unsubscribed from the emails, or the study came to an end. 2,014 physicians completed the survey. Of those respondents, 237 indicated that they were currently practicing at an Ohio CPC or CPC+ site and therefore will be included in the analysis.

Results: Results are currently being analyzed and will be reported at the Ohio Pharmacy Residency Conference.

Conclusions: Results are currently being analyzed and will be reported at the Ohio Pharmacy Residency Conference.
**Impact of a stewardship initiative to improve outpatient management of community acquired pneumonia (CAP) in the emergency department**

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**UAN:** 0048-0000-18-200-L01-P

**Learning Objectives:**

1. Describe the 2007 Infectious Disease Society of America guideline recommendations for outpatient treatment of community acquired pneumonia.  
2. Discuss recent literature regarding the optimal duration of therapy for outpatient management of community acquired pneumonia.

**Purpose:**  
Community acquired pneumonia (CAP) is a common infection in the United States, with 915,900 episodes occurring each year. Although there have been multiple studies demonstrating the positive impact that antimicrobial stewardship initiatives have on reducing antimicrobial misuse in the inpatient setting for CAP, there are a lack of data for stewardship interventions aimed at patients who present to the emergency department (ED), but are not admitted. The primary objective of this analysis is to determine the impact of an ED based stewardship intervention on the optimal management of CAP in the outpatient setting.

**Methods:**  
A retrospective, quasi-experimental study of adult patients with CAP who were discharged directly from the Sinai-Grace Hospital emergency department from 1/1/17 - 6/30/18 with an ICD9/10 code for CAP will be performed. Patients will be excluded if they have underlying structural lung disease, a concurrent infection requiring antibiotics, if they are on antibiotics at time of ED presentation, or should have been admitted and refused inpatient treatment. In November 2017, the ED staff was educated on the appropriate management of CAP in outpatients. These sessions focused on CAP diagnostics, antimicrobial selection, dose, and duration. Patients managed before the educational sessions will be compared to those managed after the educational sessions, and the primary objective is to assess the impact of the educational intervention on compliance with guideline recommendations for CAP. Appropriateness is defined by meeting all components of a "CAP bundle" encompassing the accurate diagnosis of CAP, appropriate antibiotic selection, dose, and duration of therapy. Secondary outcomes include ED readmission rates, antibiotic-related admissions, 90-day adverse drug events, and incidence of clostridium difficile infections.

**Results:** To be discussed

**Conclusions:** To be discussed
Evaluation of inpatient insulin dose requirements and glycemic control in patients using U-500 insulin

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UAN: 0048-0000-18-201-L01-P

Learning Objectives:

1. Explain the role of U-500 insulin and considerations for ensuring its safe use
2. Review the results of literature investigating inpatient insulin dose requirements and glycemic control for patients using U-500 insulin prior to admission

Purpose:
Available literature suggests that patients using U-500 insulin prior to admission may have reduced inpatient insulin requirements, with greater reduction for patients switched to U-100 insulin compared to those continued on U-500 insulin. Limited literature also suggests that there is greater hypoglycemia and severe hyperglycemia incidence in patients continued on U-500 insulin. It is currently unclear which patients may continue on their prior-to-admission insulin regimen and which require insulin dose adjustment upon admission. The study objectives include evaluation of inpatient insulin dose requirements and glycemic control of patients using prior-to-admission U-500 insulin.

Methods:
This IRB-approved, multi-hospital retrospective review included adults with an inpatient admission of 24 hours or longer who had a documented prior-to-admission U-500 insulin regimen and who received insulin during hospitalization. Patients with unclear prior-to-admission regimens, receiving U-500 insulin via pump, without inpatient insulin doses or blood glucose readings, and repeat hospital encounters for the same patient were excluded. Patient identification and data abstraction occurred through report generation and manual data collection through the electronic health record.

Patients were classified into those continued on U-500 insulin and those transitioned to U-100 insulin based on insulin type used longer than 50% of the length of stay. Patients were further stratified by prior-to-admission insulin total daily dose and hemoglobin A1c. Outcomes were compared between these groups. The primary outcome was mean inpatient insulin total daily dose and percent of prior-to-admission total daily insulin dose. Secondary outcomes included median inpatient blood glucose and percent of hyperglycemic events (BG > 180 mg/dL) and severe hyperglycemic events (BG > 250 mg/dL). Percent of hypoglycemic events (BG ≤ 70 mg/dL), clinically significant hypoglycemic events (BG < 54 mg/dL), and severe hypoglycemic events (BG ≤ 40 mg/dL) served as safety outcomes.

Results: Research in progress, to be presented.

Conclusions: Research in progress, to be presented.
Asymptomatic Bacteriuria Treatment Rates in an Emergency Department Following Implementation of an Uncomplicated Urinary Tract Infection Treatment Guide: A Retrospective Quasi-Experimental Study

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UAN: 0048-0000-18-202-L01-P

Learning Objectives:

1. Review Infectious Diseases Society of America (IDSA) asymptomatic bacteriuria guidelines.
2. Describe effectiveness of an interdisciplinary intervention in reducing asymptomatic bacteriuria treatment rates.

Purpose:
Urinary tract infections (UTI) are among the most commonly occurring bacterial infections in the United States. With the high prevalence of UTI, it is common to empirically treat individuals with antimicrobial agents before UTI is confirmed via urine culture. Based on Infectious Diseases Society of America (IDSA) guidelines for the diagnosis and treatment of asymptomatic bacteriuria (ASB) in adults, not all patients with confirmed bacteriuria warrant treatment with antimicrobial agents. Current literature reports the use of antibiotics in 32%-58% of patients without specific UTI symptoms or diagnosed asymptomatic bacteriuria. Interventional studies targeting antimicrobial stewardship endpoints exist in the literature, however a small number have targeted the reduction of antibiotic use in ASB.

Methods:
The objective of this study is to implement an antimicrobial stewardship intervention within the emergency department (ED). This single-center, quasi-experimental retrospective study will evaluate the impact of an antimicrobial stewardship intervention within the ED. Education and a UTI treatment guidance document will be provided to ED practitioners. In addition, order questions verifying UTI symptoms will be added for antibiotic orders within computerized physician order entry software. The aim of these interventions is to improve awareness regarding ASB within the ED as well as provide treatment recommendations for uncomplicated UTI supported by national guidelines and ED antibiogram data.

Results: Analysis of specific aims both pre- and post-implementation of antimicrobial stewardship interventions will be conducted. The primary aim of this study is to compare rate of treatment for presumed ASB. Secondary aims of this study include comparing the selection rates of appropriate empiric antimicrobial agents as well as treatment duration for uncomplicated UTI.

Conclusions: Finalized analyses and conclusions will be presented at the Ohio Pharmacy Residency Conference.
Defining Interventions made by Pharmacists and Pharmacy Students at a Charitable Pharmacy

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UAN: 0048-0000-18-203-L04-P

Learning Objectives:

1. Recognize and discuss the common categories of drug related problems identified during a complete medication review and those unique to a charitable pharmacy
2. Explain severity levels as they pertain to pharmacist driven interventions in a Medication Therapy Management service and discuss the importance of estimated cost avoidance when communicating return on investment

Purpose:
Medication Therapy Management (MTM) is defined as “a service or group of services that optimize therapeutic outcomes for individual patients.” MTM includes services such as medication reviews, immunizations, medication safety surveillance, pharmacotherapy consults and many other clinical services. The OutcomesMTM Connect™ Platform is one of the most common online platforms used to document MTM interventions. OutcomesMTM® uses its externally validated Actuarial Investment Model (AIM®) to help pharmacies quantify the value of their patient interventions. This model helps pharmacies communicate return-on-investment (ROI) and estimated cost avoidance value (ECA) to key stakeholders. The Charitable Pharmacy of Central Ohio (CPCO) provides many services included in MTM such as complete medication reviews, point of care testing, and medication safety surveillance, but the current system of tracking interventions is limited. CPCO does not currently have a way to calculate and communicate ECA and ROI to community partners and donors. Capturing data about MTM interventions and ECA is important to demonstrate value to key stakeholders in the community. Through a collaboration with OutcomesMTM®, CPCO will have the opportunity with this study to quantify and evaluate drug related problems and their corresponding ECA.

Methods:
The researchers will evaluate a sample of interventions made by student pharmacists and pharmacists by reviewing patient notes in the electronic medical record at the charitable pharmacy. Interventions will be categorized as acute diagnoses or information from the patient encounter note. Further categorization will include type of medication related problem (Indication, Efficacy, Safety, Adherence, Access, Medical Emergency) and severity level. Researchers will document the action taken to resolve the problem and the result of that action. An estimated cost avoidance (ECA) value will then be determined based on severity level in collaboration with external collaborators at OutcomesMTM®.

Results: Data collection is in progress. Preliminary results will be presented at the Ohio Pharmacy Residency Conference.

Conclusions: Data collection is in progress. Preliminary results will be presented at the Ohio Pharmacy Residency Conference.
Implementation of clinical pharmacy services in the emergency department of a community hospital: a pilot study

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UAN: 0048-0000-18-204-L04-P

Learning Objectives:

1. Describe evolving roles for clinical pharmacists within the emergency department setting
2. Identify cost avoidance associated with pharmacists’ interventions in the emergency department of a community hospital

Purpose:
The emergency department (ED) is a relatively chaotic, fast-paced environment prone to a high rate of medication errors. The benefit of clinical pharmacy services in the ED has demonstrated an increase in patient safety, improved quality of care, and likely has associated cost avoidance. Despite this fact, many hospitals, including Lima Memorial, have not implemented such services. One probable reason is that of the literature available, most are from large teaching centers with very few community hospital represented. The primary aim of this project is to implement and assess the impact of clinical pharmacy services in the ED of a community, non-teaching hospital.

Methods:
A pharmacist and resident provided clinical pharmacy services at a 329-bed community hospital. Total number of interventions, type of interventions, and acceptance rate of interventions were documented over a 7-week period. Interventions were categorized as: drug-drug/drug-disease interaction, prevent or manage drug allergy, adjust dosage or frequency, prevent or manage adverse drug event, drug not indicated, or therapeutic recommendation. Each intervention will be assigned a predetermined dollar value for cost avoidance derived from published literature. The primary outcome will be estimated yearly cost avoidance, extrapolated from intervention data. Secondary outcomes will include acceptance rate and perception of services provided. Acceptance rate has been documented within each intervention. Anonymous electronic surveys utilizing a five point Likert scale were distributed to ED health care professionals before and after the pilot period to evaluate perception of clinical pharmacy services.

Results: Data analysis is in progress. Results and conclusions will be presented at the 2018 Ohio Pharmacy Resident Conference.

Conclusions: Data analysis is in progress. Results and conclusions will be presented at the 2018 Ohio Pharmacy Resident Conference.
Retrospective study of treatment of elevated blood glucose in insulin-naive postoperative total knee and hip replacement patients.

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UAN: 0048-0000-18-205-L01-P

Learning Objectives:

1. Explore the association between post-operative glucose control and risk of infection/readmission rates.
2. Discuss Mercy Health Fairfield Hospital’s Insulin Protocol for post-operative total arthroplasty patients.

Purpose:
Evidence has shown that hyperglycemia is associated with an increased risk of complications and mortality in hospitalized patients, and evidence has also proven that intensive glucose control reduces the risk of systemic infections. In surgery patients, the presence of hyperglycemia has been associated with prolonged hospital stay, infection, disability after hospital discharge, and death. Postoperative infections affect approximately 1-7% of all total joint arthroplasties, at an estimated cost of approximately $50,000 per infection.

With current literature supporting the need for postoperative glucose control in patients after total joint arthroplasties, Mercy Health Fairfield Hospital recently established an Insulin Protocol to be followed by the nursing staff, beginning with PACU nurses, and continued by the nursing staff on the inpatient post-surgery floor. The protocol was established using evidence from the RABBIT 2 Trial by application of basal/bolus dosing when postoperative glucose readings are >200 mg/dL. Because the RABBIT 2 trial evaluated the use of basal bolus/SSI with type 2 diabetes patients only, the results could not be entirely extrapolated to Mercy Health Fairfield’s Insulin Protocol as patients undergoing surgery were not all diabetic patients. The protocol utilizes a medium dose sliding scale with ACHS administration for patients with blood glucose readings >140. The specific protocol is outlined in the methods section.

The aim of this study is to determine incidence of episodes of hyper/hypoglycemia in total arthroplasty postoperative patients using the Mercy Health Fairfield Hospital’s Insulin Protocol. This study will evaluate the effectiveness of the protocol in reducing incidence of hyperglycemia, which in turn will decrease the chance for postoperative infections, increased length of stay, disability after discharge, and death.

Methods:
This study is a retrospective cohort study of postoperative blood glucose control in patients who have undergone total hip or total knee replacement surgeries. The study population includes patients admitted to Mercy Health Fairfield Hospital between September 1, 2016 and December 31, 2017 for total hip and total knee replacement surgeries. Once the study population is identified, patients will be classified into two different groups: those with a past diagnosis of diabetes mellitus and those without a
diabetes diagnosis. The algorithm below displays the established protocol for administration of insulin based on blood glucose readings post surgery. Point-of-care (POC) blood glucose readings were administered in the PACU post surgery, at 2100 on the day of surgery, and at 0800 the day following surgery. PACU and floor nurses gave doses of insulin based on the algorithm below. Patients who are insulin dependent are started back on their home insulin regimen following surgery. Episodes of hypoglycemia were defined as documented blood glucose readings of 140mg/dL. This value was chosen based on Mraovic et al. which concluded that non-diabetic patients were three times more likely to develop an infection if their postoperative blood glucose was &gt;140 mg/dL.

Insulin Protocol Algorithm
If &gt;200 mg/dL in PACU- administer prandial insulin (0.05 units/kg) and insulin glargine (0.15 units/kg) and discontinue oral hypoglycemic medications.
If &gt;140 mg/dL and 180 mg/dL at 2100, administer insulin ACHS using medium sliding scale and discontinue oral hypoglycemic medications.
If fasting

**Results:** Data is currently being collected and analyzed. Results and conclusions will be presented at the Ohio Pharmacy Residency Conference.

**Conclusions:** Data is currently being collected and analyzed. Results and conclusions will be presented at the Ohio Pharmacy Residency Conference.
Cefepime and altered neurological status in renally impaired patients

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Krista Wahby, PharmD, BCCCP, Clinical Pharmacist Specialist, DMC, Ryan Mynatt, PharmD, BCPS-ID, Clinical Pharmacist Specialist, DMC, Jason Pogue, PharmD, BCPS-ID, Clinical Pharmacist Specialist, DMC

UAN: 0048-0000-18-206-L01-P

Learning Objectives:

1. Describe the typical presentation of neurotoxicity associated with cefepime therapy.
2. Discuss weaknesses of the available literature in regards to the association of neurotoxicity and cefepime use.

Purpose:
Multiple case series have described neurotoxic events in patients receiving cefepime, and small analyses suggest this might be more common in renally impaired patients. However, robust comparative data are lacking. Therefore, the primary objective of this study is to determine the comparative neurotoxicity between cefepime and other anti-pseudomonal beta-lactams in patients with renal impairment.

Methods:
A prospective cohort study of 324 patients within Detroit Medical Center Sinai-Grace Hospital who receive cefepime versus a comparator intravenous anti-pseudomonal beta-lactam antibiotic agent (meropenem or piperacillin/tazobactam) will be performed. The primary outcome will be the development of any neurologic symptoms consisting of encephalopathy, including decreased level of alertness, myoclonus, seizures, or any combination of these. Patients will be eligible for inclusion if they are ≥ 18 years of age and receive a target antibiotic for ≥ 48 hours with concurrent creatinine clearance of 10 - 50 mL/min from December, 1, 2017 through June 30, 2018. Patients will be excluded if they require renal replacement therapy, are neurologically altered at baseline, are receiving sedation while on therapy, or are unevaluable for a neurotoxic endpoint. Eligible patients will be identified prospectively through the use of Theradoc alerts and will be assessed daily for the development of neurotoxicity. Data collection will include demographics, co-morbid conditions, severity of illness, dose and duration of antibiotic exposures, ICU admission, relevant laboratory parameters, microbiology data, and concomitant seizure-threshold lowering and neurotoxic agents. Bivariate and multivariate analyses will be performed to identify the independent impact of cefepime exposure on the development of a neurologic adverse event.

Results: Data collection is in progress.

Conclusions: Preliminary data suggest the incidence of cefepime associated neurotoxicity is low and not significantly higher than comparator agents.
**Immunotherapy for advanced non-small cell lung cancer (NSCLC): experience at Louis Stokes Cleveland VA Medical Center (LSCVAMC)**

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Candice Wenzell, PharmD, BCOP; Charles J. Nock, MD

**UAN:** 0048-0000-18-207-L01-P

**Learning Objectives:**

1. Identify the place in therapy for nivolumab in the treatment of advanced non-small cell lung cancer.
2. State the mechanism of action of nivolumab.

**Purpose:**
Utilization of immunotherapy in the veteran population with lung cancer is not well described. The purpose of this study was to evaluate the use of nivolumab (nivo) versus chemotherapy (chemo) in veterans with previously treated advanced NSCLC at LSCVAMC.

**Methods:**
This retrospective chart review included veteran subjects with stage IIIB or IV NSCLC who received at least one dose of nivo or chemo at LSCVAMC following disease recurrence after at least one prior platinum-containing chemo regimen from January 1, 2010 to August 31, 2017. Subjects who received immunotherapy as 1st line (1L) or more than 4 lines of chemo were excluded. Nivo subjects were matched 1:1 to subjects who received chemo based on the line of therapy nivo was used (index therapy). The primary endpoint was overall survival (OS) percentage at 1 year following start of index therapy. Secondary endpoints included overall response rate, incidence of adverse events, and rate of discontinuation of treatment due to adverse events.

**Results:** There were 98 subjects (49 nivo, 49 chemo) included. Histology was squamous in 49%, adenocarcinoma in 45%, and other in 6%. The index therapy was 2L in 61 subjects, 3L in 33, and 4L for 4. In nivo and chemo groups, ECOG=1 in 42 and 15 subjects and ECOG=2 in 8 and 12 subjects, respectively, and not documented in 12 subjects in chemo group. OS at 1 year was 28% for nivo and 16% for chemo. Treatment discontinuation due to adverse events occurred in 12% for nivo and 41% for chemo.

**Conclusions:** The percentage of subjects alive at 1 year was higher in the nivo group. OS rates found in this study were lower than previously published studies. This may be related to the high number of subjects with squamous histology, ECOG 2, and evaluation of subjects receiving index therapy as 3L or 4L.
Evaluation of midodrine as an oral vasopressor: A retrospective chart review

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Learning Objectives:

1. Review current literature regarding midodrine as an oral vasopressor
2. Describe the use of midodrine use in intensive care units at a community hospital

Purpose:
Background: Intravenous (IV) vasopressors are often used to provide hemodynamic support in patients who experience severe hypotension or shock. The administration of continuous IV vasopressors is commonly restricted to an intensive care unit (ICU) due to the need for close hemodynamic monitoring and dose titration. This restriction is a barrier for clinically stable patients who are otherwise eligible for ICU discharge, aside from requiring low dose IV vasopressors. Recent studies have evaluated midodrine as a possible oral vasopressor due to its action as an alpha-1 agonist and have shown promising results for midodrine’s ability to enable weaning from IV vasopressors and potentially reduce ICU length of stay.

Purpose: Evaluate the possible clinical and cost saving benefits of midodrine as an oral vasopressor in ICU patients.

Methods:
The study design is a two-arm retrospective chart review comparing patients receiving midodrine plus an IV vasopressor (midodrine group) with patients receiving IV vasopressors alone (comparator group). Patients were retrospectively identified through a medication report from 2011 to 2017. The intervention group included all adult Fairview Hospital ICU patients receiving midodrine while on one of the following IV vasopressors: norepinephrine, epinephrine, phenylephrine, dopamine, or vasopressin. Patients were excluded from the intervention group if they received midodrine

Results: Will be presented at the Ohio Pharmacy Resident Conference.

Conclusions: Will be presented at the Ohio Pharmacy Resident Conference.
The implementation of a standardized alcohol withdrawal protocol within a large, teaching hospital
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UAN: 0048-0000-18-232-L01-P

Learning Objectives:

1. Define alcohol withdrawal syndrome and identify clinical manifestations of alcohol withdrawal in the critically ill
2. Describe the use of midodrine use in intensive care units at a community hospital

Purpose:
Alcohol use disorder (AUD) is an extremely prevalent disease with a lifetime prevalence of 17.8%. It is even more common in the intensive care unit (ICU), with up to one-third of patients presenting with concomitant AUD. These patients experience worse outcomes, including prolonged mechanical ventilation and increased hospital length-of-stay. The incidence of alcohol withdrawal syndrome (AWS) increases in patients admitted to the ICU and presentations can be more severe and detrimental. The objective of this study is to determine if the implementation of a novel protocol can have a positive impact on the management of AWS in the ICU.

Methods:
This study is a quality improvement, pre- and post-interventional study. Data will be collected in a retrospective manner via chart review prior to and after the implementation of a novel alcohol withdrawal protocol. Patients will be identified via the ordering of the institution’s Clinical Institute Withdrawal Assessment for Alcohol (CIWA) protocol as well as international classification of diseases (ICD)-10 codes for alcohol-related disorders. The protocol will include the implementation of the prediction of alcohol withdrawal severity scale (PAWSS) risk stratification tool to determine who requires pre-emptive alcohol withdrawal treatment. Patients in both the pre- and post-interventional groups will be assessed via CIWA scores to assess severity of withdrawal, average total benzodiazepine or barbiturate doses administered per patient, ICU length-of-stay, hospital length-of-stay and duration of mechanical ventilation. Additionally, the frequency of points attributed to each PAWSS question will be collected to assess correlation between AUD characteristics and withdrawal. Data will be collected and compared between groups to determine the benefits of the AWS protocol utilization in the ICU.

Results:
Data collection is ongoing. Results and conclusions will be presented at the Ohio Pharmacy Resident Conference.

Conclusions: Results and conclusions will be presented at the Ohio Pharmacy Resident Conference.
National Trends in Statin Medication Prescribing in Patients with a History of Stroke or Transient Ischemic Attack

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Learning Objectives:

3. Describe the current literature and guideline recommendations regarding statin use in patients with a history of stroke or transient ischemic attack (TIA)
4. Discuss the national prevalence and predictors of statin therapy among patients with a history of stroke/TIA
5. Recognize patient specific factors associated with statin use and non-use

Purpose:
Statin therapy is recommended to reduce the risk of stroke and cardiovascular events among patients with ischemic stroke or transient ischemic attack (TIA) presumed to be of atherosclerotic origin. The objective of this study is to assess the national prevalence and predictors of statin medication use in the ambulatory care setting in patients with a history of stroke or TIA. The primary endpoint is the percentage of patients with a history of stroke or TIA receiving statin therapy. Secondary endpoints include the association between specific patient demographics including sex, age, race, region, BMI/body weight, payment type, and prescriber specialty.

Methods:
This is a retrospective, cross-sectional, national study utilizing data from the 2014-2015 national Ambulatory Medical Care Survey (NAMCS) that will include visits for patients with a history of stroke and/or transient ischemic attack. Visits will be excluded in the presence of atrial fibrillation, anticoagulation therapy, hepatic/biliary dysfunction, pregnancy, and an age of

Results: A total of 719 unweighted surveys were included in data analysis. The 719 unweighted surveys represent a total of 12,757,311.07 office visits. Statin therapy was initiated or continued in 46.8% (95%CI:41.0%-52.7%) of visits. The majority of visits assessed patients that were male (50.8%), Caucasian (76.5%), ≥ 75 years old (36.2%), and covered by Medicare (61.3%). Upon multivariate analysis, positive predictors of statin therapy included a diagnosis of hyperlipidemia (OR:6.581;95%CI:3.410-12.702), a documented race of Black or Hispanic (OR:2.615;95%CI:1.168-5.855, OR:4.760;95%CI:1.912-11.851, respectively), and angiotensin converting enzyme inhibitor or aspirin therapy (OR:3.765;95%CI:2.018-7.024, OR:2.907;95%CI:1.154-5.814, respectively). Negative predictors include midwestern or southern geographical locations (OR:0.346;95%CI:0.162-0.884, OR:0.449;95%CI:0.229-0.884, respectively) and female sex (OR:0.529,95%CI:0.303-0.923).

Conclusions: Based upon these results, various factors impact statin therapy use with overall utilization being suboptimal.
Short-term knowledge change following an educational sacubitril/valsartan video

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Learning Objectives:

1. Identify the role of sacubitril/valsartan in the treatment of reduced ejection fraction heart failure
2. Describe the population that may benefit from an educational sacubitril/valsartan video

Purpose:
At St. John Hospital and Medical Center there is an educational video available for all heart failure medications except for sacubitril/valsartan. The aim of this study was to create an educational sacubitril/valsartan video and assess its effectiveness in patient education compared to standard pharmacist counseling.

Methods:
This study is a randomized controlled trial approved by the investigational review board at St. John Hospital and Medical Center in Detroit, Michigan. Patients who were discharged on sacubitril/valsartan were enrolled beginning in January 2018. Patients were excluded from the study if they had a diagnosis of dementia, were pregnant, did not have a cellphone enabled to receive text messages or failed a validated health literacy test. Enrolled patients were asked a pre- and post-questionnaire, both before and after watching an educational video or standard pharmacist counseling. The questionnaires were composed of identical questions and assessed their level of knowledge on sacubitril/valsartan. Patients were followed up after 14 days with either a text message containing the link to the education video or phone call. The final questionnaire was administered 30 days after initial education to assess knowledge retention.

Results: Patient enrollment and data collection is still ongoing; preliminary results will be presented at the 2018 Ohio Pharmacy Resident Conference.

Conclusions: To be determined
Impact of a pharmacist-driven vancomycin stewardship initiative utilizing Staphylococcus aureus nasal polymerase chain reaction assays in pneumonia patients

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Learning Objectives:

1. Review the evidence supporting the use of MRSA nasal PCR assays for antimicrobial de-escalation in pneumonia.
2. Describe how MRSA nasal PCR assays can be effectively used as an antimicrobial stewardship resource for pharmacy services in a hospital setting.

Purpose:

Nasal polymerase chain reaction (PCR) assays detecting methicillin-resistant Staphylococcus aureus (MRSA) have 98-99% negative-predictive value in ruling out MRSA in community-acquired and healthcare-associated pneumonia (CAP/HCAP). Cleveland Clinic Medina Hospital implemented an antimicrobial stewardship initiative allowing pharmacists to order nasal MRSA PCR swabs in CAP/HCAP patients receiving intravenous vancomycin and make recommendations for vancomycin discontinuation based on a negative result. This study evaluates the efficacy and safety of the stewardship intervention.

Methods:

This retrospective, quasi-experimental chart review included inpatients receiving intravenous vancomycin for CAP/HCAP between August 15, 2016 through December 15, 2016 (pre-protocol) or August 15, 2017 through December 15, 2017 (post-protocol). Patients developing pneumonia 48 hours or more after admission or receiving intravenous vancomycin for concurrent infections were excluded. The primary objective compares length of vancomycin therapy during pre- versus post-protocol period. Secondary outcomes assess 30-day mortality and hospital readmission, length of stay, time to clinical improvement, incidence of vancomycin-induced nephrotoxicity, and number of patients requiring vancomycin levels. Student’s t-test, Wilcoxon rank sum test, and Pearson’s Chi-squared test were utilized as appropriate.

Results: A total of 175 patients were included (87 pre-protocol, 88 post-protocol). Mean age, pneumonia severity index, and proportion of patients with HCAP risk factors were similar between groups. Compared with pre-protocol, post-protocol had a median reduction of 30.2 hours of vancomycin use (72.3 [IQR 47.5-128.5] versus 42.1 [IQR 25.0-66.3] hours, p < 0.0001). A significant reduction was found in the amount of patients who required vancomycin therapeutic drug monitoring (58 versus 29 patients, p < 0.0001) and a decreased time to clinical improvement. No differences were found in other secondary outcomes, including rates of vancomycin-induced nephrotoxicity.

Conclusions: A pharmacist-driven antimicrobial stewardship initiative utilizing nasal MRSA PCR assays reduced empiric vancomycin duration of therapy in patients with CAP/HCAP by 30 hours with no difference in clinical outcomes.
Capturing the impact of student pharmacists on readmission rates through transition of care interventions

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Learning Objectives:

1. Discuss the goals of implementing transition of care services
2. Review published literature on transition of care services and student pharmacist involvement in these services

Purpose:
To maximize the benefit of APPE students as pharmacist extenders, our department of pharmacy seeks to align core experiential training with patient care and departmental needs. Based on the opportunity for improvement in quality markers and a continued request for addition of a pharmacist, the Integrated Medical Unit (IMU) was identified as an area of need within our institution. In order to address this gap, a floor based medicine APPE rotation was created, focusing on transition of care activities. The goal of this study is to capture the added value of a student pharmacist to the IMU in regards to readmission rates and quantification of meaningful transitional care interventions.

Methods:
This was a quasi-experimental study design with a retrospective baseline group and prospective interventional group. The study was reviewed and approved by the institutional review board. Retrospective data was collected from January 1, 2017 until August 31, 2017; during this time, typical care was provided by a unit-based pharmacist, but there was no consistent student pharmacist presence. Prospective data was collected from October 1, 2017 until April 30, 2018; during this time, a fourth-year APPE student pharmacist was dedicated to transition of care activities on the IMU including reviewing discharge summaries, educating patients on all new medications, and promoting the bedside medication delivery service. All cause, emergency department visits, and medication-related readmissions will be compared between baseline and intervention groups. In addition, the student’s IMU activities will be reported including the number of patients who had all new medications educated at discharge, the number of discharge summary reviews, and the number of medications delivered to bedside through the pharmacy service. Chi-square will be used for categorical data and descriptive statistics will be used for all other data.

Results: Full results and conclusions to be discussed at the Ohio Pharmacy Residency Conference.

Conclusions:
The Effects of CYP2D6 Inhibitors on a High-dose Tramadol Taper for Opioid Detoxification

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Learning Objectives:

1. Outline the steps of tramadol metabolism including key enzymes involved.
2. Discuss the evidence supporting the use of tramadol for opioid detoxification.

Purpose:
The treatment of choice for opioid withdrawal at Summa Health System is a high-dose tramadol taper. Tramadol is metabolized in the liver by Cytochrome P450 (CYP) 2D6 to an active metabolite with 200 times the µ-opioid receptor affinity compared to the parent compound. The objective of this study is to evaluate the effects of CYP2D6 inhibitors on patient response to a tramadol taper for opioid detoxification.

Methods:
A retrospective chart review of patients admitted to the detoxification unit at Summa Health System who received a high-dose tramadol taper for opioid detoxification was conducted to compare patients who received concomitant moderate-to-strong CYP2D6 inhibitors to patients without concomitant therapy. The primary analysis population was the intent to treat population, which included patients who received at least one dose of the tramadol taper and at least one Clinical Institute Narcotic Assessment (CINA) score. The primary outcome was the mean change in CINA score from baseline to discharge. Secondary outcomes included the area under the curve (AUC) of CINA scores from baseline to discharge, peak CINA scores, and time to peak CINA score.

Results: Of 100 charts reviewed, 30 patients received a concomitant moderate-to-strong CYP2D6 inhibitor. There were no statistically significant differences in demographics between the two groups. The majority of patients were heroin users (63.3% in the CYP2D6 group and 74.3% in the control group). The change from baseline CINA to discharge did not differ significantly (-4.5, SD=4.48 for the CYP2D6 group vs. -4.0, SD=3.83 for the control group; p = 0.606). For secondary outcomes, no significant differences were found for the AUC of CINA scores, peak CINA scores, or time to peak CINA scores.

Conclusions: CYP2D6 inhibitors do not appear to have a significant effect on the withdrawal course for patients treated with a high-dose tramadol taper for opioid detoxification.
Incidence of Venous Thromboembolism With Aspirin Versus Enoxaparin Prophylaxis After Major Orthopaedic Surgery

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Learning Objectives:

1. Describe the pathophysiology and risk factors for venous thromboembolism related to major orthopaedic surgery
2. Review current guideline recommendations for pharmacologic prophylaxis for venous thromboembolism prevention after total hip arthroplasty, total knee arthroplasty and hip fracture surgery
3. Discuss the efficacy of aspirin versus enoxaparin for venous thromboembolism prophylaxis after major orthopaedic surgery

Purpose:
Venous thromboembolism (VTE) following major orthopaedic surgery is a highly recognized complication with the highest incidence occurring several days after procedure. Although both the American College of Chest Physicians (ACCP) and the American Academy of Orthopaedic Surgeons (AAOS) recommend pharmacologic prophylaxis, there is no consensus on agent selection or duration of therapy. The ACCP prefers low molecular weight heparin (LMWH) to other agents, although in clinical practice, a variety of agents are utilized. The primary objective of the study is to evaluate the incidence of VTE in patients receiving prophylactic therapy with enoxaparin or aspirin after major orthopaedic surgery.

Methods:
A non-interventional, retrospective cohort study was conducted in patients ≥18 years of age who underwent major orthopaedic surgery between January 1, 2012 through December 31, 2016 within 11 sites of the Cleveland Clinic Health System. Patients were evaluated up to 90 days after surgery for incidence of VTE or major bleeding. Reports were generated from the electronic medical record and data was analyzed using Chi-squared and descriptive analyses.

Results: A total of 2282 patients underwent major orthopaedic surgery during the study period. Patients were excluded if they received VTE prophylaxis with agents other than enoxaparin or aspirin. Of these patients, 847 patients were evaluated (aspirin=426, enoxaparin=421) and 87 readmissions were identified. Eighteen patients qualified for inclusion based on the primary safety and efficacy endpoints. Incidence of VTE occurred in 4 (0.98%) patients in the aspirin group and in 5 (1.35%) patients in the enoxaparin group (difference of 0.37%; P=0.63). Major bleeding occurred in 3 (0.74%) patients in the aspirin group and in 7 (1.89%) patients in the enoxaparin group (difference of 1.15%; P=0.16).

Conclusions: Aspirin prophylaxis is not statistically different than enoxaparin for the prevention of VTE or major bleeding within 90 days following major orthopaedic surgery.
Evaluation of the oral chemotherapy service at Beaumont cancer clinics

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UAN: 0048-0000-18-215-L04-P

Learning Objectives:

1. Discuss the shift in oncologic care involving chemotherapy agents
2. Describe potential complications related to the use of oral chemotherapy agents for patients

Purpose:
The increasing prevalence of oral chemotherapy (OCT) has introduced new challenges for practitioners. There has been a shift in drug administration that is largely self-managed by the patient or caregiver in the home setting. This has increased the risk for non-adherence, drug interactions, and adverse effects, and is therefore potentially affecting therapeutic outcomes and patient safety. OCT management services have shown to improve pharmacotherapy management and facilitate interventions to minimize potential safety and efficacy concerns associated with OCTs. This study evaluated the need and efficacy of the current practice model used for OCT management at the Beaumont infusion clinics.

Methods:
A retrospective cohort review of electronic medical records of patients who were prescribed OCT for cancer treatment was conducted. Data collected included patient demographics, comorbidities, cancer profile, and documented issues encountered by patients.

Results: Sixty-two patient charts were analyzed. The most common OCTs were capecitabine (18%), palbociclib (13%) and lenalidomide (13%). Patients were on an average number of 11 concurrent medications. Overall complications identified included OCT-related side effects (53%), insurance and prior authorization issues that delayed the start of treatment (21%), and hospital admissions (27%). Approximately 11% of patients were admitted to the hospital due to infections. The number of documented side effects that occurred from OCTs within the first 14 days after starting treatment was 29%; the majority of these side effects were weakness and fatigue, nausea and vomiting, diarrhea, and new onset of atrial fibrillation.

Conclusions: With the continued growth of OCTs and new changes to governmental regulations, healthcare providers, including pharmacists, will be integral to provide early medical interventions, facilitate drug approval processes and to optimize patient follow-up after the initiation of treatment. This study showed the current need for additional support of clinical services for patients on OCTs within the Beaumont outpatient cancer clinics.
Use of activated partial thromboplastin time (aPTT) levels in transitions of factor Xa inhibitors to unfractionated heparin (UFH) in an anti-Xa monitoring community health system

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Learning Objectives:

1. Describe challenges in monitoring unfractionated heparin (UFH) therapy in patients transitioning from factor Xa inhibitors
2. Discuss the rationale for the use of aPTT assays rather than anti-Xa assays in the monitoring of UFH for select patients

Purpose:
Unfractionated heparin (UFH) is frequently monitored utilizing anti-Xa levels. Anticoagulation with oral factor Xa inhibitors can falsely elevate anti-Xa levels at baseline, resulting in a difficult transition to UFH. The purpose of this study is to determine if monitoring of UFH therapy after transition from a factor Xa inhibitor can be improved by utilizing activated partial thromboplastin time (aPTT).

Methods:
A new protocol was implemented on August 1st, 2017 instructing pharmacists to adjust heparin therapy based on aPTT levels only for the first 48-72 hours of heparin therapy when patients are transitioned from a factor Xa inhibitor. Patients were identified from August 2016 to December 2016 (standard protocol utilizing anti-Xa levels), and from August 2017 to December 2017 (new protocol utilizing aPTT levels), and the two protocols were compared. The primary objective is the time to first therapeutic aPTT or anti-Xa level. Secondary objectives include the percentage of patients therapeutic at 24 and 48 hours, the percentage of therapeutic levels obtained, and number of dosage adjustments between groups.

Results: The time to first therapeutic level was 13.2 hours in the anti-Xa monitored group compared to 7.6 hours in the aPTT-monitored group (p=0.13). Fifty-two (81.3%) patients in the anti-Xa monitored group were therapeutic within 24 hours, compared to 33 (63.5%) patients in the aPTT-monitored group (p=0.052). Patients monitored with aPTTs had subtherapeutic initial levels more frequently compared to patients monitored with anti-Xas (30.8% versus 14%). There were no differences in percentage of therapeutic levels obtained, number of dosage adjustments, or bleeding events.

Conclusions: Utilizing aPTT levels rather than anti-Xa levels in these patients resulted in a non-statistically significant trend toward faster time to therapeutic anticoagulation. Larger studies are needed to elucidate the impact of utilizing aPTT levels versus anti-Xa levels in this patient population.
Description of Pharmacy Interventions during Transitions of Care of Inpatients Consulted to the Palliative Care Service

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Learning Objectives:

1. Describe barriers to successful transitions of care (TOC), in particular for palliative care patients
2. Recommend pharmacy focused solutions to TOC barriers based upon current transitions of care programs at Summa Health System (SHS) Akron Campus

Purpose:
The Summa Transitions Excellence Program (STEP) demonstrated decreased readmissions for a medical surgical floor within Summa Health System (SHS) Akron Campus. The purpose of this initiative is to describe outcomes when expanding STEP to patients with an active palliative care consult throughout the hospital.

Methods:
The initiative provided STEP to patients admitted to SHS Akron Campus and consulted to the palliative care service between November 1st, 2017 and February 16th, 2018 not enrolled in hospice at admission. STEP consists of the following components which were replicated:

1. Verification of home medication list
2. Admission medication reconciliation
3. Medication adherence screen
4. Therapeutic evaluation and consultation with team if necessary
5. Disease state and new medication counseling
6. Confirmation and communication of post-discharge follow-up
7. Discharge medication reconciliation
8. COPD Home Intervention Program education
9. Provision of “After Visit Summary” to patient
10. Follow-up phone call within 2 business days

The primary outcome was the number of clinically significant interventions performed by pharmacy team. The secondary outcomes include 30 and 60 day readmission rates, analysis of contributing factors to readmission rates, number of pharmacy interventions within each intervention subtype. Descriptive statistics were used to evaluate all objectives with regression models used for predictors of readmission.

Results: 310 clinically significant interventions were performed for 94 total patients. Readmission rate at 30 days was 14.9%. STEP in palliative care patients demonstrated an average number of clinically significant interventions higher than those previously seen with STEP (3.3 per patient vs. 0.82 respectively).

Conclusions: Future efforts should embed the palliative STEP pharmacist within the care team to reach more patients and improve recommendation follow-up. Further results and conclusions will be presented at the 2018 Ohio Pharmacy Resident Conference.
Characterization of sugammadex use and retrospective comparison to neostigmine for reversal of neuromuscular blockade at a community hospital

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Learning Objectives:
1. Explain the importance of quick and complete reversal of neuromuscular blockade (NMB)
2. Describe the mechanism of sugammadex and neostigmine in reversal of NMB

Purpose:
It is important to achieve complete and quick reversal of neuromuscular blockade (NMB) post-anesthesia to prevent risks associated with residual NMB. Neostigmine is an acetylcholinesterase inhibitor classically used for reversal of neuromuscular blockade after surgery. Sugammadex, a modified γ-cyclodextrin, forms a complex with neuromuscular blocking agents and reduces the amount available to bind to nicotinic cholinergic receptors in the neuromuscular junction. First, this study aims to characterize the use of sugammadex in our community hospital. Second, the study will retrospectively compare the effectiveness and safety of sugammadex to neostigmine.

Methods:
This retrospective study will be completed in two phases. The objectives of the first phase are to characterize the patient populations and the surgery types in which sugammadex is being used at the institution. Data collection will include surgery type, renal function, age, gender, weight/BMI, and cardiac history. In the second phase of the study, a two-month cohort of sugammadex use will be identified and compared to a similar cohort of neostigmine prior to the approval and addition of sugammadex to the formulary in regards to effectiveness and safety when used for the reversal of NMB. Prior to sugammadex approval, neostigmine was the reversal agent of choice in these patients. The sugammadex cohort will be taken from May-June 2017 and the neostigmine cohort will be from May-June 2016 in an effort to control for bias. The following data will be collected and compared among the two cohorts: time to extubation, number of re-intubations, time to transfer out of the operating room (OR), total length of surgery, dose of paralyzing agent, dose of reversal agent, and anaphylaxis. Appropriate statistical analyses for continuous and nominal data will be conducted.

Results: Data is currently being collected and analyzed. Results and conclusions will be presented at the Ohio Pharmacy Residency Conference.

Conclusions: N/A
Management of Diabetic Ketoacidosis in the Emergency Department: To bolus or not to bolus?

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Learning Objectives:

1. Describe the pathophysiology behind DKA and recognize the symptoms associated with it.
2. Identify the pros and cons of an initial insulin bolus in the management of DKA in the ED.

Purpose:
Diabetic ketoacidosis (DKA) is a common presentation in the emergency department (ED), with a mortality rate of approximately 2-5%. Insulin administration is essential for management. Patients are placed on an insulin infusion at a rate of 0.1 units/kg/hour. The utility of the initial insulin bolus (0.15 units/kg) before initiation of the drip is controversial. It can potentially overcome the relative insulin-resistant state patients with DKA present in, leading to a faster resolution of DKA. However, there is concern for hypoglycemia and rapid changes in serum osmolarity, which can lead to complications. Previous studies have shown that in pediatrics, the initial insulin bolus is not recommended, however there is little data for either side in adults. The aim of this study was to compare outcomes for the management of DKA between patients who receive an initial insulin bolus as compared to those who receive no bolus.

Methods:
This is a retrospective review of patients aged 18 years or older admitted to the Detroit Medical Center from January 2012 to July 2017 with an ICD-9/10-CM diagnosis of DKA and initiated on an insulin infusion. Exclusion criteria included: HHS, metabolic AG acidosis (non-DKA), CKD stages 3/4, ESRD on dialysis, immunosuppressive therapy, and pregnancy. Data collection included: demographics, precipitating factors, and lab values. The primary outcome was time to resolution of DKA (when the AG returned to < 12). Secondary outcomes included: amount of insulin received, duration of infusion, and ED/ICU/hospital LOS. Safety outcomes are: incidences of; hypoglycemia, hypokalemia, and glucose variability. A Chi-square or Fisher’s Exact test were used to assess categorical data and a student t-test was used to assess continuous data. A p-value less than 0.05 was considered statistically significant.

Results: Final results will be presented at the Ohio Pharmacy Residency Conference.

Conclusions: Final conclusions will be presented at the Ohio Pharmacy Residency Conference.
Impact of Pharmacist-driven Spirometry Screening to Target High Risk Patients in a Primary Care Setting

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Learning Objectives:

1. Identify factors that put patients at high risk for Chronic Obstructive Pulmonary Disease
2. Describe the role pharmacists can have in spirometry in the primary care setting

Purpose:
The purpose of this study is to determine the effect of proactive pharmacist identification of high risk patients eligible for diagnostic spirometry testing on the percentage of appropriate spirometry referrals ordered and the percentage of spirometry tests completed in those that qualify.

Methods:
This prospective study compares spirometry referrals ordered and tests completed between an intervention site and control site within a Federally-Qualified Health Center (FQHC). At both sites, all patients who have a primary care provider (PCP) appointment and qualify for spirometry referral on the designated intervention dates during a 12-week period were included in this study. Qualification for spirometry was determined by preset criteria: 40 years of age or older, current tobacco smoker, no contraindications/cautions for spirometry testing, and no spirometry results in chart within last 3 years. At the intervention site, the pharmacist recommended a spirometry screening to the PCP prior to identified patients’ appointments. At both sites, a chart review will be completed after the intervention dates to determine if referrals were ordered and tests were completed for patients who qualify.

Results: The number of patients eligible for diagnostic spirometry testing at the intervention and control sites was 190 (n=125 vs. 65, respectively). Baseline characteristics were comparable between sites except for differences in language and race. Among eligible patients, the percentage of referrals ordered was significantly higher at the intervention site (47.2% vs. 7.7%, p

Conclusions: Preliminary results of this study suggest that pharmacists proactively identifying high-risk patients for spirometry screenings within a FQHC increases appropriate referrals ordered by PCPs and completed by high-risk patients. This population health approach to spirometry testing represents an emerging role for pharmacists and could be adopted in other primary care settings.
Assessment of Patients Who May Benefit from Antipsychotic Pharmacogenomics Testing

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UAN: 0048-0000-18-221-L04-P

Learning Objectives:

1. Describe improper use of antipsychotic medications in the geriatric population
2. Recognize reasons for pharmacogenomics testing in selected patients

Purpose:
Use of antipsychotic medications in geriatrics is considered inappropriate when used for the behavioral and psychological symptoms of dementia (BPSD). Along with expected adverse side effects, antipsychotics have shown an increased risk of mortality when used in geriatric patients with dementia. Reasons for the various adverse events, may partially be due to individual metabolic profiles leading to enhanced or reduced metabolism potentially contributing to ineffective or toxic doses. Up to 50% of long-term care residents may experience polypharmacy during their stay, leading to an increase in pill burden, cost, and adverse events. Pharmacogenomic testing before initiation of an antipsychotic medication could; reduce the delay in effective therapy from the trial and error of multiple agents, effects of polypharmacy, and use of concomitant psychoactive medications.

Methods:
The hypothesis was that pharmacogenomic testing prior to initial antipsychotic initiation would reduce the overall number antipsychotic medications prescribed by &gt;1 between groups. To determine this, a retrospective, institutional review board approved case control study was conducted. Patient chart data was analyzed from January 1st 2014 through February 28th 2018 at two long-term care facilities. The control group consisted of antipsychotic naïve patients ordered a single antipsychotic medication with no changes made to antipsychotic order during duration of therapy. The study group consisted of patients receiving &gt;1 antipsychotic who had received order changes during course of therapy; this included medication changes only. The study methods will hopefully illustrate pharmacogenomic testing results align with optimal medication choice in the control group, and suboptimal medication choice in the study group, resulting in polypharmacy. A total of 100 randomized resident charts were being studied (50 in each treatment arms) to detect a difference of &gt;1 more psychoactive medications as the primary endpoint with a 95% confidence interval and an alpha level

Results: Preliminary

Conclusions: Research in progress
Analysis of Direct Oral Anticoagulant Use at an Academic Medical Center

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Learning Objectives:

1. Given a patient case, classify the prescribing of a direct oral anticoagulant (DOAC) as appropriate or inappropriate.
2. Identify the most common cause of inappropriate DOAC prescribing at the University of Toledo Medical Center (UTMC) before and after the implementation of an anticoagulant transition pharmacy policy.

Purpose:
The primary objective of this study is to determine the prevalence of appropriate DOAC prescribing at an academic medical center before and after implementation of a pharmacy-managed anticoagulation transition policy. Secondary objectives include: 1) assess patient-specific factors associated with inappropriate DOAC prescribing and 2) determine the prevalence of adverse effects, bleeding and thromboembolic events, associated with inappropriate DOAC use.

Methods:
A retrospective, quasi-experimental study was conducted. Adult patients admitted to a non-intensive care unit at an academic medical center who received DOAC therapy during hospitalization were eligible for inclusion. The pre-pharmacy-managed anticoagulant transition procedure (pre-implementation) group includes patients admitted from February 1, 2014 to January 31, 2015 which will be compared to the post-pharmacy-managed anticoagulant transition procedure (post-implementation) group which includes patients admitted from February 1, 2015 to January 31, 2016. DOAC prescribing was considered appropriate if the DOAC had been ordered for the correct indication at the correct dose and frequency, with no contraindicated drug-drug interactions present, and correct anticoagulant transition. Patients who were inappropriately prescribed a DOAC were evaluated for the incidence of adverse events. To meet power, 290 subjects total were needed. Results were statistically significant if the two-sided p-value < 0.05.

Results: A total of 145 and 146 patients were included in the pre-implementation and post-implementation groups, respectively. In the pre-implementation group, 46.9% of patients received an appropriately prescribed DOAC, compared to 58.2% of patients in the post-implementation group (p = 0.053). There were no bleeding or thromboembolic adverse events related to inappropriate DOAC use.

Conclusions: The implementation of a pharmacy-assisted anticoagulation transition policy did not significantly affect the overall appropriateness of DOAC prescribing.
Pilot Study of a Pharmacist-Driven CDC Recognized Diabetes Prevention Program through Ohio Northern University’s HealthWise, a University Work-site Wellness Service

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Learning Objectives:

1. Review prediabetes and the role of a pharmacist in its management
2. Describe the CDC’s Diabetes Prevention Program and PREVENT T2 curriculum
3. Illustrate ONU HealthWise’s DPP class and clinical outcomes

Purpose:
The Centers for Disease Control and Prevention (CDC) recognizes the effectiveness of Diabetes Prevention Programs (DPP) in preventing the transition from prediabetes to diabetes. Ohio Northern University’s HealthWise provides pharmacist driven health screenings for those insured through the university, and have identified patients who qualify for the CDC’s program. The university setting, existing patient pool, and self-insured environment, provides the perfect backdrop for a pharmacist driven DPP program. The purpose of this study is to describe the process of implementing this service, the effectiveness of pharmacists in the role of DPP coaches, and the health outcomes for patients enrolled.

Methods:
A twelve-month program, beginning in January 2017, will enroll a cohort of patients who meet the criteria set forth by the CDC. The patients will be identified through HealthWise screenings and patient self-selection. Patient demographic information and baseline labs will be collected prior to beginning the program. The in person meetings will follow the PREVENTT2 curriculum, led by a team of trained pharmacists with the help of student pharmacists on advanced pharmacy practice experience rotations. Meetings will occur on Ohio Northern University’s campus, and will include lectures focused on healthy living, weight and exercise check-ins, and activities to reinforce topics learned. Patients who enroll will be incentivized through the health insurance benefits of the university, and the improvement of their own health. The primary outcome of the CDC’s DPP program is weight loss, and requirements of the program include tracking weight, diet, and exercise. However, additional labs including A1C, blood pressure, fasting glucose, and cholesterol will be tracked, as well as surveys to measure participant’s attitude towards the program, and their own knowledge.

Results: Currently, twenty patients are enrolled in the ONU HealthWise DPP and meeting weekly. Baseline and quarter two labs have been taken and analyzed, as well as baseline patient perception measurements. Final results will be available at the conclusion of the program, December 2018.

Conclusions: Pharmacists are effective at delivering DPP curriculum, and attaining successful clinical outcomes. In particular, practice settings such as work-site wellness programs are a great place to expand services to include a DPP. As billing for these services becomes more common practice, this kind of service may even provide a revenue stream for certain practitioners.
Comparison of linezolid and vancomycin in the treatment of Methicillin-Resistant Staphylococcus aureus (MRSA) pneumonia at a large, community teaching hospital

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Learning Objectives:

1. Recall the primary treatment options for MRSA pneumonia
2. Discuss the use of linezolid compared to vancomycin for treatment of MRSA pneumonia
3. Report study findings and conclusions

Purpose:
MRSA is a frequent pathogen in pneumonia yet no consensus on optimal treatment has been established. Studies report conflicting data whether linezolid has superior activity in MRSA pneumonia compared to vancomycin. The goal of this study was to evaluate clinical efficacy and cost of linezolid compared to vancomycin in treatment of MRSA pneumonia.

Methods:
Patients diagnosed with MRSA pneumonia from July 2014 through July 2017 were included in this retrospective study if greater than 18 years old and treated with the study antimicrobial for at least 48 hours. Data collected included demographics, qSOFA score, comorbid conditions, steady-state vancomycin levels, and MIC’s. Additionally, days to resolution of symptoms, length of hospital stay, and all-cause mortality within 30 days of discharge, were collected. The primary outcome was clinical success, defined by resolution of infection by day 14, as determined by the treatment team. Duration of hospital stay, all-cause mortality, and cost were evaluated as secondary outcomes.

Results: In total, 149 patients were diagnosed with MRSA pneumonia, 123 patients were included in data analysis (vancomycin N=60; linezolid N=63). From the linezolid group, 54 patients were empirically treated with vancomycin before switching to linezolid. Baseline characteristics, including qSOFA were similar. Statistically significant differences were identified for clinical success by day 14 (vancomycin: 58.3%, linezolid: 34.9%; p=0.009). The secondary outcome for average length of stay was shorter in the vancomycin group 15 +/- 9.84 days, compared to linezolid, 20.25 +/- 12.54 days (p=0.005). Results for 30 day all-cause mortality were not significant (p=0.88). Vancomycin had an average cost $34.70 versus $381.28 for linezolid (p

Conclusions: Vancomycin provided faster clinical success and shorter duration of hospital stay compared to linezolid, without differences in mortality rates. Vancomycin also provided a lower cost of treatment compared to linezolid.
Evaluation of a pharmacist medication review service in an outpatient heart failure clinic

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Learning Objectives:

1. Identify the types of interventions most commonly made by an ambulatory heart failure pharmacist.
2. Discuss the ability of a clinical pharmacist in an ambulatory heart failure clinic setting to impact drug related problems.

Purpose:
Heart failure (HF) patients have complex medication regimens. The purpose of this study was to evaluate the impact of pharmacist medication reviews on drug related problems (DRPs) in an ambulatory HF population.

Methods:
The HF pharmacist medication review service incorporates a comprehensive medication review note provided to the cardiologist evaluating patients in a HF clinic. A retrospective chart review was performed on 64 control patients with no previous pharmacist review and 64 intervention patients who had a pharmacist medication review. The primary endpoint was the number of DRPs identified per patient in the intervention group two weeks after pharmacist medication review compared to the number of DRPs identified per patient in the control group. Secondary endpoints included the level of impact of each DRP recommendation and the acceptance rate of DRPs.

Results: Patients averaged 66 years of age and 18 medications at baseline. Comorbidities were similar between groups. Diabetes was more prevalent in intervention patients (p=0.0215). The average DRPs per patient was reduced from 2.80 to 1.95 in intervention group after pharmacist intervention. There was a statistically significant difference between the average DRPs per patient in the control and intervention groups, 2.55 DRPs versus 1.95 DRPs per patient, respectively (p=0.016). The most common DRPs were related to HF, drug interactions, and dyslipidemia. Thirty-seven percent of DRP recommendations were accepted by HF providers in the intervention group. Medication adherence (78%), renal dosing (67%), hypertension (58%) and HF DRPs (55%) had the highest acceptance rate. Eighty-seven percent of DRP recommendations in the intervention and control groups were high impact recommendations, resulting in medication changes. A systolic blood pressure reduction (122.1mmHG to 107.97mmHg) was also observed in the intervention group (p=0.035) after pharmacist medication review.

Conclusions: Pharmacist medication reviews in an ambulatory HF clinic lead to significantly fewer drug related problems.
Analysis of the relationship between serum vitamin D Levels and fall risk in geriatric patients in the post-acute care setting

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Learning Objectives:

1. Describe the current conflicting evidence that exists in literature regarding the relationship of serum vitamin D levels and fall/fracture risks.
2. Identify potential opportunities for pharmacists to assist in preventing and reducing patient falls.

Purpose:
Currently, conflicting evidence regarding the relationship of serum vitamin D levels and fall risk exists; several studies associate elevated levels with increased risk while others reveal the opposite. Despite possible safety concerns associated with serum vitamin D levels outside of normal limits, the impact of vitamins on patient outcomes is often disregarded. The purpose of this study is to determine if there is a correlation with fall risk based upon the Morse Fall Scale in patients in the post-acute setting with serum vitamin D levels within normal limits compared to patients with serum vitamin D levels outside of normal limits.

Methods:
A retrospective chart review will be conducted consisting of patients receiving post-acute care at the facility between January 2016 and July 2017. The electronic medical record system will be used to identify patients who have experienced a fall. Inclusion criteria will include patients who meet all of the following: greater than or equal to 65 years of age, unintentional fall within the designated time frame, and a serum vitamin D level drawn post fall or within the previous 6 months of the fall and recorded in the facility’s records. Exclusion criteria will include patients less than 65 years old and/or patients lacking a Morse Fall Scale assessment prior to the fall at the facility. The primary endpoint will measure serum vitamin D levels and analyze the relationship between the serum vitamin D levels and the Morse Fall Score. Secondary endpoints include analyzing patient outcomes through inspecting patient quantity of falls, length of stay, post-fall readmissions, and fractures occurring from assessed fall. Descriptive statistics will be used to assess correlation within the collected data.

Results: Data analysis is in progress.

Conclusions: Data collection and analysis are currently being conducted; results and conclusions will be presented at the 2018 Ohio Pharmacy Resident Conference.