Evaluation of the impact of pharmacist intervention on hemoglobin A1C for diabetic employee program in southern Ohio.

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UAN: 0048-0000-23-006-L01-P

Learning objectives:

1. Evaluate the impact of the pharmacist intervention on patients with diabetes in rural areas like southern Ohio
2. Analyze the effective ways that can help reduce the risk of complications of diabetes, and the health care cost on society.

Purpose:

Diabetes is a chronic disease that has a major impact on the population, it affects more than 34.2 million Americans and their families, and the number of newly diagnosed patients and those with complications are dramatically increasing. Those patients' health literacy is very important, especially in rural areas like southern Ohio. The study goal is to measure the impact of pharmacists-led patient care on patients A1C with diabetes before and after enrolling in the diabetic employee program held by Holzer Health System.

Method:

This study was approved by the institutional review board of Marshall University. The inclusion criteria include a patient diagnosed with diabetes (Type1 or Type2) who has Holzer health insurance and received diabetes diagnoses from their provider with an established A1C goal. Also, the patient must attend a 9-hour diabetes self-education management class. After meeting all these criteria, the patients will be officially enrolled in the program and will be rewarded by waiving their copay on diabetes medications. After 3 months from their group class, a pharmacist would review each patient's profile and asks the patient to have a new A1C lab done. The pharmacist would contact each patient individually and provides comprehensive medications reviews (CMRs) which include reviewing patients' medications, diet, and exercise, also helping them set a goal to make them able to reach their required A1C by their physician. If the patient had higher than 8% A1C, they would have to retake the class every 12 months and meet with the pharmacist every 14 days for follow-up. If the patient has an A1C level between their provider goal and 8%, they will have to meet with the pharmacist every 1-3 months and attend the diabetes self-education management class every 12 months. In case the patient reaches their A1C goal, the follow-up will be every 6-12 months with the pharmacists, and the diabetes self-education management class will be every 2 years. The diabetes self-education management class is accredited by the American diabetic association (ADA).

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

Conclusion: The results of this study show how valuable pharmacists are in terms of helping patients reduce not just A1C but also other comorbid conditions through educating, managing, and following up.

Evaluation of Specialty Pharmacy Relationship in Delayed Start of Oral Chemotherapy and How Pharmacist Play a Role

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Learning Objectives:

1. Discuss the importance of oral chemotherapy as a cornerstone of oncolytic treatment in ambulatory cancer center
2. Identify barriers to patient care in receiving medication from specialty pharmacy
3. Describe areas for improvement in processing that pharmacist can implement for process improvement

Purpose:

In 2022 out of 11 new medications for oncology use approved by the FDA 6 of these medications are oral chemotherapy. This is a trend of therapy that has been seen in the United States and the world as the treatment of oncology disease states becomes a more targeted approach. Guidelines for the treatment of oncology disease states has also started to include these medications as 1st line or subsequent therapies. With the increase of oral chemotherapy use, the use of specialty mail order pharmacies has also increased due to access to the medications through manufacturer or insurance contracts limits the availability of these medications to retail pharmacies and institutional pharmacies. With the use of mail order pharmacies barriers to treatment can sometimes be seen such as delays in receiving oral chemotherapy due to, cost, prior authorization, confusion on setting up delivery, and lack of communication. OptumRx a specialty mail order pharmacy is the primary specialty pharmacy used by Blanchard Valley Health System Armes Family Cancer Care Center. The quoted time to delivery for oral chemotherapy medications from OptumRx is 7-10 business days but from initial analysis the usual delivery time is approximately 30 days.

Methods:

This study will analyze the cause of these delays including prior authorization time, logistic or delivery delays, medication supply chain or patient-specific factors as to why oral chemotherapy medications are delivered later than average. Data will be collected through evaluation of patient surveys including what medication they take, what delivery provider or pharmacy they use, how often they have had a delay in their medication delivery, and what the patient believes the delay to delivery is. From here as pharmacists, we will devise an implementation plan for proactively solving these insurance and delivery problems to shorten delivery time. The specific pharmacist interventions will be cost analysis, patient education gaps, or prior authorization delays. This will allow for analysis of pre and post-implementation analysis of pharmacist intervention to determine significance of pharmacist intervention. Ultimately, leading to overall process improvement for a decrease in the delay of delivery of oral chemotherapy.

Results:

Results will be presented at the 2023 Ohio Pharmacy Residency Conference.

Conclusion:

Discussion of results will be presented at the 2023 Ohio Pharmacy Residency Conference

Are Two Better than One? Evaluation of the Effects of a Paired Pharmacist-Diabetes Educator Visit in Outpatient Clinics

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Learning Objectives:

1. Identify potential barriers to patients achieving diabetes goals.
2. Identify barriers to patients attending DSMES and MNT.

Purpose:
In March of 2020, a paired-visit pilot program began at an outpatient clinic to improve diabetes care. New patients referred to a clinical pharmacist under collaborative practice agreement for diabetes management were simultaneously referred to medical nutritional therapy (MNT) with a certified diabetes educator (CDE). A retrospective cohort study was conducted to assess the program's impact.

Methods:
Patients who were referred between May 2018 and April 2022 were considered for inclusion and, if eligible, placed into one of three groups: paired-visit, pharmacist-only, or no visit. Primary outcome was change in hemoglobin A1c (HgbA1c) from baseline to six and twelve months. Secondary outcomes included change in body mass index (BMI), change in show rate to diabetes self-management education (DSMES) and MNT visits, and change in emergency department (ED) visit frequency in which the chief complaint was hyper- or hypoglycemia.

Results:
A total of 275 patients were included. Groups differed in age, race/ethnicity, insurance status and baseline medications, but otherwise were similar. Mean HgbA1c at baseline visit was above 10% for each group. There was a significant difference in the primary endpoint of HgbA1c for patients with both six- and twelve-month values. Patients in the paired visit group averaged 7.59%, 8.22% in the pharmacist-only group and 9.37% in the no visit group ($p < 0.001$). No differences were found between groups in BMI or ED visits. Patients in the paired visit group had the greatest number of DSMES and MNT visits in the year after baseline visit compared to no visit and pharmacist-only groups (Mean number of classes: 0.96 vs 0.13 vs 0.43; $p<0.001$).

Conclusion:
Implementation of the paired visit program yielded the lowest A1c values and significantly improved DSMES and MNT visit show rates when compared to patients who only saw the pharmacist or did not see the pharmacist or CDE.

Assessment of Risk Factors for Hyperkalemia with Administration of Sulfamethoxazole and Trimethoprim

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Learning Objectives:

1. To evaluate the risk factors associated with hyperkalemia in diverse patient populations undergoing treatment with cotrimoxazole.
2. To classify the identified risk factors into modifiable and non-modifiable categories and assess the correlation between the dosage and duration of cotrimoxazole therapy and the heightened occurrence of hyperkalemia.
3. To define appropriate monitoring parameters tailored to each of the identified risk categories.

Purpose:

This study is designed to investigate the incidence of hyperkalemia in patients treated with cotrimoxazole at the Detroit Medical Center (DMC) and identify risk factors associated with its occurrence. Despite the well-documented association between cotrimoxazole use and hyperkalemia, this serious side effect often goes unaddressed by practitioners, and no clear monitoring guidelines exist. Prior studies have excluded immunosuppressed patients and those with renal impairment, leaving a gap in the literature that we aim to fill. Our study aims to develop monitoring parameters to monitor for hyperkalemia in patients using cotrimoxazole, and our findings may inform future clinical guidelines for cotrimoxazole use.

Methods:

This multicenter, retrospective, case-control study of adult patients treated with cotrimoxazole at the DMC between January 1st, 2021, and December 31st, 2021, has been approved by the Institutional Review Board. The study will collect patient demographic information, comorbid conditions, laboratory values, concomitant medications, treatment parameters, and other factors associated with hyperkalemia, such as diet, using the electronic medical record system. The primary objective is to determine the incidence of hyperkalemia in patients treated with cotrimoxazole. Risk factors associated with hyperkalemia will be identified using univariate and multivariate logistic regression analyses, with statistical significance defined by a p-value less than 0.05. The study aims to provide insight into the development of monitoring parameters for hyperkalemia in patients using cotrimoxazole and to inform future clinical guidelines for cotrimoxazole use.

Results:

Results for this study are pending the completion of data collection and analysis. Upon completion, findings will be analyzed and summarized. Further details regarding the results will be provided in the final study report.

Conclusions:

Conclusions for this study will be made after analysis of results. The study is ongoing, and further details regarding the conclusions will be provided in the final study report.

Impact of Pharmacist Care Bundle on 30-Day Readmissions in High-Risk Underserved Patients

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Learning Objectives:

1. Define the social determinants of health and its impact on health outcomes.
2. Identify factors that contribute to 30-day readmission in high-risk patients.
3. Describe pharmacist interventions that can be utilized to lower 30-day readmission.

Purpose:
A pharmacist care bundle program was implemented in 2022 with the goal to improve health outcomes and reduce healthcare costs for underserved patients by reducing the risk of medication errors and nonadherence. Pharmacists performed structured clinical and socio-economic assessments for barriers to medication management and employed several mitigation strategies. The purpose of this study is to assess the impact of the pharmacist care bundle program on 30-day readmission.

Methods:
In this single center retrospective cohort study, 103 patients receiving the pharmacist care bundle between September 1, 2022 – February 6, 2023, were compared to 195 historical controls discharged between March 1, 2022, and June 30, 2022. Patients included underserved adult patients below 200% of the federal poverty level with a documented 30-day readmission within the past year and at least one disease associated with medication complexity (COPD, DM, MI, CHF). The primary outcome was 30-day readmission in the overall cohort and in subgroups characterized by disease state, readmission history, and social determinants of health. The secondary outcomes were characterization of specific pharmacist interventions and cost benefit analysis of the care bundle program.

Results:
In the pharmacist care bundle group, 43% of patients readmitted to hospital within 30 days, as compared to 57% in the control group (relative risk [RR] 0.73; 95% CI, 0.57-0.95, p=0.015). In aggregate, pharmacists contributed 593.5 hours over a five-month period and made 269 interventions were made in 103 patients, 2.6 +/- 1.2 interventions per patient. The top four pharmacist interventions in the care bundle group were medication reconciliation (30%), therapeutic modifications (18%), assisting with social issues (18%), patient counseling (12%).

Conclusions:
Pharmacist care bundle was associated with significant reduction in 30-day readmissions in high-risk underserved patients.

Success rates for in-vitro fertilization (IVF) and intrauterine insemination (IUI) following COVID-19 vaccination at University Hospitals

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Learning Objectives:

1. Define the processes involved with assisted reproductive technologies (ART).
2. Review the correlation between COVID-19 vaccination status and in-vitro fertilization (IVF) and intrauterine insemination (IUI) success rates seen at University Hospitals (UH).

Purpose:
Development of COVID-19 vaccines has led to concerns regarding long-term effects, including vaccine impact on pregnancy and fertility treatment. The purpose of this study was to determine if a correlation exists between COVID-19 vaccination status and in-vitro fertilization (IVF) and intrauterine insemination (IUI) success rates at University Hospitals (UH).

Methods:
A retrospective single center medical chart review was completed for patients who underwent IVF or IUI at UH Fertility Center from July 1, 2021 to June 30, 2022. Inclusion criteria consisted of female patients 18-45 years old who received a primary series of one of the following COVID-19 vaccinations: Pfizer, Moderna, or Janssen. The primary outcome was to assess the number of successful IVF and IUI cycles following receipt of any COVID-19 vaccine manufacturer, confirmed by a positive pregnancy (HCG) test post procedure. Secondary outcomes were as follows: number of live births, number of miscarriages, and success rates per vaccine manufacturer.

Results:
Of the 468 patients evaluated, 149 met inclusion criteria for data analysis. For the primary outcome, 96 of 149 (64.4%) patients, IVF and IUI combined, had a cycle leading to a positive HCG result. For the secondary outcomes, there were 23 miscarriages, 67 live births, and 6 ongoing pregnancies following a positive HCG result. Combined IVF and IUI success rates were as follows: 71.4% for Janssen (n = 7), 60.4% for Moderna (n = 53), 66.3% (n = 83) for Pfizer, and 66.7% for unknown manufacturers (n = 6).

Conclusion:
Overall, there was a 64.4 % success rate for IVF and IUI cycles combined following any primary series of COVID-19 vaccination, similar to what is expected compared to pre-vaccine IVF success rates at UH Fertility Center. Therefore, this indicated no impact on IVF and IUI success rates following COVID-19 vaccination.

Value of Clinical Pharmacists in Neurology Clinics at an Academic Medical Center

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Learning Objectives:

1. Review current literature pertaining to pharmacy involvement in neurology clinics and pharmacists' involvement with medication access
2. Describe clinical pharmacists' role and outcomes in ambulatory care neurology clinics at an academic medical center

Purpose:

Patients diagnosed with neurologic diseases, such as multiple sclerosis (MS), amyotrophic lateral sclerosis (ALS), or myasthenia gravis (MG), often have complex medical needs. While the medications to treat these conditions may have favorable patient outcomes, such as reducing disease relapse rates or emergency department (ED) visits, they often require prior authorization, close laboratory monitoring, and patient education. Furthermore, patients often require vaccinations, medication interaction monitoring, and additional neurology health support.

In 2020, The Ohio State University Wexner Medical Center (OSUWMC) incorporated pharmacy services into the OSU neuroimmunology and neuromuscular clinics. Pharmacists in these clinics help facilitate medication access for patients and assist with screening, education, and safe medication monitoring by offering pharmacist led visits. The study aim was to describe the value that pharmacist integration into OSUWMC neurology clinics has brought by measuring time to new start neurology medications. It also describes additional interventions made by pharmacists in the neurology pharmacy clinics.

Methods:

A retrospective chart review was conducted reviewing 6 months in 2019 (pre-group) versus 6 months in 2022 (post-group) for patients who were seen at OSUWMC within a neurology clinic and were prescribed a medication for their neuroimmunology or neuromuscular condition. A subgroup analysis of patients in the post-group with a pharmacist visit was also performed. The primary outcome is the percent of patients who initiated a neurology medication within 90 days of initial prescription. Secondary outcomes included characterization of pharmacist interventions, such as drug information questions answered, vaccine recommendations, lab monitoring, adverse drug reactions identified, and medication changes.

Results:

Final results and conclusions will be presented at the Ohio Pharmacy Residency Conference.

Conclusions:

Final results and conclusions will be presented at the Ohio Pharmacy Residency Conference.

Evaluating Adherence to UTI DMC Guidelines and Assessing its Appropriateness in Treatment of Multi-Drug Resistant UTIs

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Learning Objectives:

1. Review current guideline recommendations for dosing multidrug resistant urinary tract infections (UTIs).
2. Assess appropriateness of treatment regimens used to treat multidrug resistant UTIs

Purpose:

Increasing spread of antibiotic resistance is of growing concern and can lead to an increase in morbidity and mortality. Large epidemiological studies are exploring the increasing resistance of even the most common pathogens that result in UTIs. Identifying alternative treatment options and focusing on relapse prevention strategies is of utmost importance to help mitigate this rising problem. The purpose of this study is to evaluate whether UTIs are being treated appropriately per facility guidelines to prevent development of multi drug resistant organisms. After reviewing an institutional medication use evaluation, the results revealed a significant misuse of antibiotics when treating UTIs. This further emphasized the need for changes to our facility UTI guidelines and importance of prescriber education. The primary objective of this study is to evaluate whether urinary tract infections growing particularly multi drug resistant organisms are being treated with an appropriate antibiotic regimen, per institutional guidelines. Secondary outcomes include duration of antibiotics, adherence, and hospital length of stay.

Methods:

This is a retrospective, multi-center chart review of patients who presented to one of two Detroit Medical Center hospitals (Sinai-Grace or Detroit Receiving Hospital) from January 2021 until March 2021. Patients aged 18 years and older, had a diagnosis of UTI, positive urine culture and symptoms suggestive of UTI. Participants will be excluded if found to be pregnant, had multiple infections present or in septic shock requiring vasopressors. Additionally, those without a urine culture or inpatient admission were also excluded. For each participant, the type of pathogen grown and prescribed antibiotics will compared to the institutional recommended treatment. Basic statistical analysis will be used to determine the proportion of participants treated adequately, duration of antibiotic treatment, adherence and length of hospital stay.

Results:

Results will be presented at the 2023 Ohio Pharmacy Residency Conference.

Conclusions:

Conclusions will be presented at the 2023 Ohio Pharmacy Residency Conference.

Implementation and evaluation of initial fill education for injectable calcitonin gene related peptide receptor antagonists at an integrated health system specialty pharmacy

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Learning Objectives:

1. Discuss the implementation of pharmacist delivered initial fill education as it relates to specialty pharmacy.
2. Review the impact of pharmacist driven initial fill education as it pertains to patients who are being treated with injectable calcitonin gene related peptide receptor (CGRPR) antagonists.

Purpose:
Evidence suggests that pharmacist lead initial fill patient education is clinically correlated with improved health related outcomes. However, quantitative data describing this correlation is limited within the specialty pharmacy space. This study seeks to provide quantitative data to support the role of specialty pharmacist driven education on patient retention of knowledge. Given the opportunity for implementation of medication related education at University Hospitals Specialty Pharmacy, this study targeted patient's filling injectable CGRPR antagonists.

Methods:
This study included adult patients receiving erenumab, galcanezumab, or fremanezumab for the first time at University Hospitals Specialty Pharmacy between the months of December 2022 and February 2023. Participants were excluded if they were previously established on therapy, or being treated for an indication other than migraine headaches. Once enrolled, participants were given two identical surveys, one before and one two weeks after pharmacist education. The survey assessed patient drug knowledge on the following categories based on the five point Likert scale: drug indication, administration, frequency, onset of action, adverse drugs events, storage, and disposal. Patient pre and post survey responses were then evaluated using Wilcoxon Signed Rank test with a significance level (α) of 0.05.

Results:
Of the 30 patients who received initial fill education, 30% (n=10) were enrolled in the study. A statistically significant difference was found between the pre and post surveys demonstrating a change from baseline knowledge after pharmacist education among four categories including: onset of action (n=9 p=0.00861), adverse drug events (n=9 p=0.00861), storage (n=7 p=0.0199), and administration (n=6 p=0.03103).

Conclusions:
Pharmacist led initial fill education is associated with increased retention of medication related knowledge in regards to onset of action, adverse drug events, storage, and administration of injectable CGRPR antagonists. However, further research is needed in order to define this association among other specialty pharmacy drugs.

Evaluating the role of infectious disease consults in pediatric patients with *Staphylococcus aureus* bacteremia

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Learning Objectives:

1. Describe background information regarding *Staphylococcus aureus* bacteremia (SAB) in pediatric healthcare settings
2. Review the efficacy of infectious disease consults (IDC) to no IDC on pediatric patient outcomes in the treatment of SAB

Purpose:

Staphylococcus aureus bacteremia is one of the most common causes of community and health-care associated bloodstream infections in both adults and children. Infectious disease consults have been shown to reduce mortality and improve outcomes for adult patients with SAB. Adult guidelines for SAB at the Detroit Medical Center require an IDC, however there are no such guidelines for pediatric patients. The purpose of this study is to compare the outcomes of IDC vs no IDC for pediatric patients with SAB at the Children's Hospital of Michigan (CHM).

Methods:

This is a single center, retrospective chart review study comparing the outcomes of pediatric patients with SAB with and without an IDC. Patients less than 18 years of age and who had a positive blood culture for *Staphylococcus aureus* between January 1, 2019 and December 31, 2021 were included. Patients with polymicrobial blood infections were excluded. The primary outcome measured was 30-day all-cause mortality. Secondary outcomes included length of hospital stay, duration of antibiotic therapy, and readmission due to recurrent SAB within 30 days after discharge. Additional data evaluated method of SAB acquisition, line infections, time from positive blood culture to IDC, *Staphylococcus aureus* susceptibilities, prophylactic ethanol or antibiotic lock use, initial and final antibiotic selection, and compliance with proper clinical management of SAB. Nominal data was analyzed with chi-squared tests and continuous data was analyzed by Student's t-test.

Results:

Final results will be presented at the 2023 Ohio Pharmacy Residency Conference.

Conclusion:

Discussion of results and statistical analyses will be presented at the 2023 Ohio Pharmacy Residency Conference.

Assessment of a Community Pharmacist Remote Monitoring Service in Patients Using Continuous Glucose Monitors (CGMs)

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Learning Objectives:

1. Review American Diabetes Association (ADA) glycemic targets for patients using CGMs
2. Discuss considerations and barriers when initiating a CGM in certain patient populations
3. Describe clinical benefits and changes in glycemic targets after remote CGM monitoring interventions completed by a community pharmacist

Purpose:

The purpose of this study is to evaluate the impact of a community pharmacist-led CGM remote monitoring service on patients' glycemic metrics. The American Diabetes Association (ADA) has promoted the use of CGMs to improve glycemic metrics and allow patients with diabetes to optimize their blood glucose control. Previous studies have concluded that CGMs lead to less hypoglycemia events, and patients with a higher percentage time in range (TIR) value leads to a better A1c level. The use of cloud-based platforms allows pharmacists to make medication regimen changes and provide patients with solutions to improve their glycemic metrics. Community pharmacists routinely dispense CGMs for patients with diabetes and are well-positioned to assist patients in learning about their devices. Community pharmacists routinely provide diabetes educational and medication adherence services, but there is a lack of remote CGM monitoring data in community pharmacies.

Methods:

This study will be conducted within one regional division of a chain community pharmacy, which consists of 100 pharmacies. Eligible patients will be identified via prescription fill reports from the pharmacy management system for patients who use CGM devices. Patients must be 18 years of age or older and have a previous diagnosis of Type 1 or Type 2 diabetes. During the initial enrollment visit, the pharmacist will review prior CGM data with the patient, record their latest A1c value, and complete a standardized questionnaire covering potential diabetes standards of care recommendations. Patients will be monitored, complete telephonic follow-up appointments during remote monitoring, and glycemic metric data will be collected every two weeks. Patients are followed up on a consistent cadence every four weeks and more frequently if their glycemic metrics meet study protocol specifications for a patient safety intervention. Pharmacists will contact the patient's diabetes care provider with therapeutic recommendations based upon common CGM metrics. CGM glycemic metrics will be assessed using descriptive statistics, and McNemar's test will be used when comparing each patient's CGM metrics pre- and post-assessment. Standards of diabetes care and CGM utilization rates will be assessed using descriptive statistics.

Results:

Data is 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

Incidence of Dexmedetomidine Withdrawal in Adult Critically Ill Patients in a Community Hospital Setting

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Learning Objectives:

1. Discuss the correlation of dexmedetomidine use and withdrawal in critically ill adults
2. Describe the dose, duration, and suspected incidence of dexmedetomidine withdrawal in the critically ill adult at a community hospital

Purpose:
Dexmedetomidine is a popular agent used in the critical care setting for sedation, commonly selected for its anxiolytic and analgesic properties, in addition to the minimal effects on respiratory drive. There has been an increase in usage of dexmedetomidine in this setting for sedation of mechanically ventilated patients and light procedural sedation. Current research has proposed mechanisms of dexmedetomidine withdrawal related to dosage and duration of drug received, however, there is limited information on the exact etiology or dose necessary for withdrawal to be observed. Common symptoms of withdrawal, including delirium, hypertension, and agitation, overlap in critically ill patients due to intensive care unit (ICU) risk factors such as prolonged mechanical ventilation and variety of sedative agents utilized. This study aims to identify the incidence of withdrawal symptoms related to dexmedetomidine use in critically ill adults at a community hospital.

Methods:
This study was a single-center, retrospective, chart review completed at Mercy Health – Lorain Hospital in patients who received dexmedetomidine during hospitalization from January 1, 2021 through December 31, 2021. The primary outcome was to determine the incidence of withdrawal from dexmedetomidine in a community hospital setting. Secondary outcomes included the length of hospital stay, duration of dexmedetomidine use, and the total administration dose of dexmedetomidine. Criteria for the identification of withdrawal included RASS > +1 and at least heart rate > 90 bpm or hypertension defined as systolic blood pressure > 140 mmHg or a MAP > 90. Patients were excluded if admission diagnosis included active withdrawal from any substance, if a CIWA-AR score was > 10 within 24 hours of admission, or if lorazepam was utilized for elevated CIWA-AR protocol.

Results:
To be presented at the 2023 Ohio Pharmacy Residency Conference

Conclusion:
Final results and statistics will be presented at the 2023 Ohio Pharmacy Residency Conference.

Impact of a Pharmacist-Led Substance Use Disorder Medication Education Group

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Learning Objectives:

1. Recognize importance of substance use disorder medication education
2. Describe the role a pharmacist can play in inpatient substance use disorder medication education

Purpose:

Substance use disorder is increasing in incidence and has major functional consequences and mortality risk. Patients with substance use disorder often experience strong cravings and repeated relapses requiring long-term treatment. Providing structured patient education prior to discharge from an inpatient psychiatric unit may better equip patients to be adherent to medications, improving disease control and decreasing hospital readmissions. The aim of this study is to evaluate if a pharmacist-led substance use disorder-focused medication education group on an adult, inpatient dual diagnosis unit reduces 30-day readmission rates compared to historical readmission rates for patients admitted to the same unit.

Methods:

This study has been deemed a quality improvement project by the Bon Secours Mercy Health (BSMH) Institutional Review Board and is being conducted at the Mercy Health – St. Charles Behavioral Health Institute. This quasi-experimental study includes adult patients admitted to the dual diagnosis unit who voluntarily attend a pharmacist-led substance use disorder medication education group during the time frame of the study. The education provided in group is focused on medications used for opioid use disorder, alcohol use disorder, and supportive medications for withdrawal. The primary outcome is 30-day readmission, and patients who complete the education will be evaluated for readmission and readmission diagnosis. The secondary outcome is patient satisfaction, evaluated with a voluntary, anonymous, six-question Likert-scale patient satisfaction survey. Readmission rate will be compared to the historical 12% rate for the same unit with a one-sample, two-tailed test of binominal proportions.

Results:

Data collection is ongoing.

Conclusions:

NA

Factors affecting steroid responsiveness in septic shock

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Learning Objectives:

1. Discuss the benefits of steroid administration in septic shock
2. Identify patient characteristics that may predict steroid responsiveness in septic shock

Purpose:

Intravenous corticosteroids, specifically hydrocortisone, have been recommended in the treatment of septic shock since the first Surviving Sepsis guideline. While our understanding of the role of corticosteroids in critically ill patients has improved, uncertainty exists about how to best identify which patients will benefit from therapy. Benefits are tempered by adverse effects like immunosuppression and endocrine disturbances, leading to corticosteroids being recommended only after patients have received other therapies for at least 4 hours. We sought to identify characteristics that may make patients likely to respond to corticosteroids to select appropriate therapy early in the course of critical illness.

Methods:

This was a single-center, retrospective cohort study of patients admitted to the University of Toledo Medical Center between January 1, 2016 and August 1, 2022. Patients were included if they were 18 years of age or older, had been diagnosed with septic shock by ICD-10 code, had received treatment with a vasopressor for at least 24 hours, and had received hydrocortisone after initiation of vasopressors for shock. Patients were excluded if they were pregnant, had a DNR-CC code status within 48 hours of hydrocortisone administration, had known contraindications to vasopressor or hydrocortisone therapy, initially received less than 200mg of hydrocortisone per day, or were initiated on vasopressor therapy at another institution. Patients were stratified into two groups after enrollment: those who responded to corticosteroid administration and those who did not. Response to corticosteroid therapy was defined as reduction in vasopressor requirements at 48 hours after the administration of the first dose of hydrocortisone.

Results:

A total of 66 patients met inclusion and exclusion criteria. Of those patients, 58 responded to therapy. Further analysis is ongoing and will be presented at the 2023 Ohio Pharmacy Residency Conference.

Conclusions:

To be presented at the 2023 Ohio Pharmacy Residency Conference.

Establishing a pharmacist-managed rural outpatient oral chemotherapy program: A Pilot Study.

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UAN: 0048-0000-23-020-L01-P

Learning Objectives:

1. Describe the process of establishing a pharmacist-managed oral chemotherapy program
2. Discuss the benefits of a pharmacist-managed oral chemotherapy program

Purpose:

Previous data shows pharmacist involvement in both ambulatory care and oncology settings improves patient outcomes and results in patient satisfaction. Research has also shown that patients in rural areas experience greater barriers to care, often related to distance to treatment. The purpose of this study is to establish a pharmacist-managed, primarily telemedicine, rural, outpatient oral chemotherapy program for patients treated at Lima Memorial Health System, and evaluate the impact pharmacists have on patient treatment, as well as patient and provider satisfaction.

Methods:

This study is a single-center, descriptive, pilot program study. It is a prospective review of pharmacist-managed oral chemotherapy interventions among a small group of revolving patients. The patient population will include patients over the age of 18 receiving oral chemotherapy services from the Lima Memorial Health System Hematology/Oncology Clinic. Due to other patients with prescribers outside of LMHS receiving infusions at the clinic, providers will only be included in the development and satisfaction surveys if they are LMHS providers. The primary endpoint for this study will be to evaluate the amount and value of interventions that pharmacists make while managing these patient's care. After data collection is finished, the interventions made will be reviewed, using the Adverse Drug Reaction Probability Scale (also known as the Naranjo scale)**.** Incomplete or indecipherable documentation will be excluded. Duplicate documentation will also be excluded.

Results:

Results obtained will be presented at the 2023 Ohio Pharmacy Residency Conference

Conclusions:

Discussion of results will be presented at the 2023 Ohio Pharmacy Residency Conference

Intravenous push antibiotics in the emergency department: education and implementation

Rachel E. Brady*, Pharm.D. - PGY1 Pharmacy Resident, St. Elizabeth Healthcare
Elizabeth L. Giordullo, Pharm.D., BCPS, BCCCP; Charles A. Harvey, Pharm.D., BCPS; Alyssa M. Penick, Pharm.D., BCPS; Nicholas D. Krabacher, Pharm.D., BCPS

UAN: 0048-0000-23-021-L01-P

Learning Objectives:

1. Review the impact of time to antibiotic administration in patients admitted with septic shock.
2. Describe the time and cost savings associated with the implementation of intravenous push antibiotics in emergency departments.

Purpose:

The timely administration of antibiotics in the emergency department can make an impact and ensure optimal patient outcomes. Intravenous push (IVP) antibiotics can serve as an alternative to intravenous piggyback (IVPB) antibiotics while providing the same pharmacodynamics and side effect profile, easing pressures associated with piggyback shortages, decreasing order to administration time, and serving as a potential cost savings for institutions. The purpose of this study was to determine if intravenous push antibiotics can decrease the time from order to administration compared to intravenous piggyback antibiotics in emergency departments.

Methods:

This multi-center, retrospective study was approved by the institutional review board (IRB). The electronic medical record system was used to identify all patients receiving a dose of IVPB ceftriaxone, cefepime, cefazolin, or meropenem during January 2022 and a sample of patients receiving a dose of IVP ceftriaxone, cefepime, cefazolin, or meropenem between November 15, 2022, and December 31, 2022, in the St. Elizabeth Healthcare Edgewood, Florence, Fort Thomas, Dearborn, Covington, and Grant Emergency Departments. Inclusion criteria included patients 18 years or older receiving at least one dose of IVPB or IVP ceftriaxone, cefepime, cefazolin, or meropenem in a St. Elizabeth Healthcare emergency department. Exclusion criteria included patients who were less than 18 years old. The primary outcome of the study was to compare the time from order to administration of IVP versus IVPB antibiotics. The secondary outcome was to compare the cost savings of IVP and IVPB antibiotic preparations.

Results:

Final results will be presented at the Ohio Pharmacy Resident Conference.

Conclusions:

Conclusions will be presented at the Ohio Pharmacy Resident Conference.

Levetiracetam for seizure prophylaxis in spontaneous intracerebral hemorrhage

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Allycia Natavio, PharmD

UAN: 0048-0000-23-022-L01-P

Learning Objectives:

1. Review current guidelines and literature for seizure prophylaxis following spontaneous intracerebral hemorrhage
2. Discuss the impact of levetiracetam for early seizure prophylaxis following spontaneous intracerebral hemorrhage

Purpose:
Approximately 10-19% of patients with a spontaneous intracerebral hemorrhage (sICH) will experience an early seizure, occurring within 7 days. Limited evidence exists to support seizure prophylaxis following sICH in the American Heart Association/American Stoke Association 2022 guidelines, however, levetiracetam is often utilized. The purpose of this study was to evaluate the incidence of early seizures following sICH in patients receiving levetiracetam for seizure prophylaxis.

Methods:
This was an institutional review board approved, single center, retrospective study of adult patients who received levetiracetam following sICH from January 1, 2016 to December 31, 2021. Patients with known causes of ICH were excluded. The primary outcome was the incidence of clinical and subclinical seizures compared to previously published literature without seizure prophylaxis. Secondary outcomes were duration of levetiracetam and presence of late seizure risk factors (age < 65 years, cortical involvement, ICH volume > 10 milliliters) in patients who experienced an early seizure.

Results:
Of 625 patients screened, a total of 165 patients were included. The mean patient age was 62.4 years (SD +/- 14.4) with a mean National Institute of Health Stroke Score at presentation of 12 (SD +/- 10.9). ICH volume greater than 30 milliliters was present in 67 patients (40.6%) with 101 patients (61.2%) having cortical involvement. Fourteen patients (8.5%) experienced an early seizure, similar to a published incidence of 13.6% in patients without seizure prophylaxis. Median duration of in-hospital levetiracetam administration was 7.1 days (IQR 10.5). All patients who experienced an early seizure were greater than 65 years and had cortical involvement. Approximately 42% had sICH volume greater than 30 milliliters.

Conclusions:
The incidence of early seizures with levetiracetam was similar to published incidence without seizure prophylaxis. Randomized controlled trials are needed to accurately assess the impact of seizure prophylaxis in the first 7 days following sICH.

Effects of Hydrocortisone Administration on Moderate to Severe Septic Shock

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Linda Park, PharmD, BCPS; Katri Golden, PharmD, BCCCP

UAN: 0048-0000-23-023-L01-P

Learning Objectives:

1. Describe the current literature surrounding the use of hydrocortisone in septic shock.
2. Discuss the outcomes associated with starting hydrocortisone at varying norepinephrine requirements.

Purpose:

Sepsis is a complex condition leading to life-threatening organ dysfunction caused by the body's response to infection. For adult patients whose sepsis progresses to septic shock, the most recent Surviving Sepsis Campaign (SSC) Guidelines recommend norepinephrine (NE) as the first line vasopressor; however, high doses of NE may be necessary to achieve hemodynamic goals in these patients. Moreover, the risk of catecholamine-induced adverse events rises with an increasing NE dose. Because of this, efforts have been made to identify adjunct therapies that possess a catecholamine-sparing effect, and thus mitigate these adverse effects. One such therapy is corticosteroids. The SSC Guidelines recommend the use of intravenous (IV) hydrocortisone (HCT) in adults with septic shock and ongoing vasopressor requirements. The studies that influence the guidelines suggest that earlier initiation of HCT is beneficial in patients presenting with shock, but other factors that determine the success of HCT in reducing morbidity, mortality, and catecholamine requirements have yet to be determined. This study seeks to determine the relationship between vasopressor requirements at the time of HCT initiation in relation to patient outcomes.

Methods:

This is a retrospective chart review designed to analyze adult patients admitted to the medical ICU between January 1, 2017 and June 30, 2022 with septic shock who had medication orders for IV HCT and IV NE. The two groups consist of patients receiving a NE dose of 0.25-0.5 mcg/kg/min and patients receiving a NE dose of >0.5 mcg/kg/min at the time of HCT initiation. The primary outcome is the percentage of patients with a 50% reduction in NE requirements or a 10% improvement in MAP within 4 hr of HCT initiation. The secondary outcomes include the percentage of patients with a 25% reduction in NE requirements within 4 hr of HCT initiation, time to any NE reduction, time to goal NE reduction, time to NE discontinuation, hospital LOS, 28-day mortality, 28-day ICU-free days, 28-day MV-free days, 28-day vasopressor-free days, the need for additional vasopressors after HCT initiation, the percentage of new onset renal failure requiring renal replacement therapy, and the incidence of adverse events including limb ischemia, severe hyperglycemia requiring insulin drip, and cardiac arrhythmias.

Results:

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

Conclusions:

Final results and conclusions will be presented at the Ohio Pharmacy Residency Conference.

Vasopressin dose escalation in critically ill patients with septic shock

Megan Brooks, PharmD – Harper-Hutzel Hospital
Krista Wahby, PharmD, BCCCP

UAN: 0048-0000-23-024-L01-P

Learning Objectives:

1. Describe current guideline recommendations for vasopressor support in critically ill patients with septic shock
2. Recognize the potential benefits of titrating vasopressin
3. Discuss outcomes of patients with septic shock comparing fixed-dose vasopressin to titrated vasopressin

Purpose:

Vasopressor support is an important intervention in septic shock, specifically for the treatment of low mean arterial blood pressure (MAP). Norepinephrine is the preferred first-line vasopressor. Vasopressin, is recommended by the Surviving Sepsis Campaign Guidelines as an adjunct to norepinephrine at a fixed dose of 0.03 units/min when MAP levels remain <65 mmHg after the initiation of first-line vasopressor therapy. Limited data exits to support higher doses, or titration of vasopressin as the package insert recommends. This study's primary goal is to determine if vasopressin doses above 0.03 units/min lead to shortened shock duration, less norepinephrine exposure and fewer arrhythmias.

Methods:

A retrospective study of adult patients admitted to three hospitals within the Detroit Medical Center from January 1st, 2020 to April 30th, 2023 diagnosed with septic shock. Patients were included if they received vasopressin as the second-line vasopressor after initiation of norepinephrine. Pregnant patients, patients <18 or > 89 years old, and those requiring extracorporeal membrane oxygenation were excluded. Patients were divided into two groups: 1) those who received a fixed-dose of vasopressin 0.03 units/min (control) and 2) those who had vasopressin titrated above 0.03 units/min (intervention). Data collected included demographic data, hospital admission details (ICU-free days and mechanical ventilator-free days at day 28), vitals (blood pressure/MAP, HR), and evidence of tissue ischemia (lactate, imaging or consultation to vascular surgery). The primary outcome was norepinephrine dose requirements including: maximum infusion rate before and after starting vasopressin, and total duration. Secondary outcomes include vasopressin dose and duration, ventilator-free days at ICU day 28, ICU-free days at day 28, incidence of new-onset tachyarrhythmias after norepinephrine initiation, and a cost analysis of the vasopressor groups based on average wholesale prices at the time of study completion. For the statistical analysis, descriptive statistics will be used for all variables, as appropriate. For continuous variables, mean or median and inter-quartile range was used as appropriate. The student t-test was used to compare continuous data. Categorical variables used total counts and corresponding percentages. The chi square test was used to compare categorical data.

Results:

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

Conclusions:

Final results and conclusions will be presented at the Ohio Pharmacy Residency Conference.

High Dose versus Standard Dose Daptomycin for Bone and Joint Infections

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UAN: 0048-0000-23-025-L01-P

Learning Objectives:

1. Review existing literature on outcomes of patients with severe infections with standard doses of daptomycin compared with higher doses.
2. Assess the dosing of daptomycin for bone and joint infections based on the results of this study.

Purpose:

Daptomycin is a useful antibiotic for treating bone and joint infections, with broad-spectrum activity against gram-positive bacteria. It is FDA-approved for complicated skin and soft structure infections and *Staphylococcus aureus* bloodstream infections, with doses of 4 and 6 mg/kg, respectively. Prior literature has suggested that higher doses may be safe and effective for severe infections in order to maximize the concentration-dependent profile of daptomycin. However, current institutional policy does not generally recommend higher doses. This study aimed to compare outcomes for bone and joint infections treated with standard doses versus higher doses of daptomycin.

Methods:

This retrospective, single-center cohort study conducted from January 2014 to June 2022 at the University of Toledo Medical Center compared high doses of daptomycin (around 8 mg/kg) to low doses (around 6 mg/kg) for adult patients with bone or joint infections who received daptomycin for at least 48 hours. The study aimed to assess the 90-day clinical cure rate, defined as symptoms resolved with no additional antibiotic therapy or surgical intervention required. Secondary objectives included 90-day all-cause mortality, readmission for bone/joint infection, elevated CPK levels, and discontinuation of daptomycin due to muscle aches.

Results:

113 patients were included (standard dose = 47, high dose = 66). The study found no significant difference in the 90-day clinical cure rate between standard dose (57%) and high dose (67%) groups *(P* = 0.317). However, the high dose group had a significantly lower 90-day readmission rate than the standard dose group (21% vs 43*%, P* = 0.015), while all other secondary objectives showed no significant difference.

Conclusions:

Our study suggests that high dose daptomycin may be safe and effective for bone and joint infections, with a significant reduction in 90-day readmission rates. These findings support the potential use of higher doses of daptomycin in bone and joint infections.

Impact of pharmacist-driven methicillin-resistant *Staphylococcus aureus* nasal swab detection protocol on antibiotic de-escalation in pneumonia patients

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UAN: 0048-0000-23-026-L01-P

Learning Objectives:

1. Discuss the potential benefits MRSA nasal swabs confer
2. Identify circumstances for the appropriate use of MRSA nasal swabs
3. Identify practical difficulties that may reduce the effectiveness of MRSA nasal swab protocols

Purpose:
Methicillin-resistant *Staphylococcus aureus* (MRSA) pneumonia carries a high risk of morbidity and mortality, resulting in common use of anti-MRSA agents for empiric treatment. Unnecessary use of these antibiotics may have negative impact on patient outcomes, cost, and antibiotic resistance. The MRSA nasal swab is a rapid diagnostic assay tool capable of ruling respiratory MRSA infections out in under 24 hours, allowing for more timely de-escalation compared to standard cultures. The purpose of this study was to measure the impact of implementing a pharmacist-led MRSA nasal swab protocol on time to de-escalation of unnecessary anti-MRSA agents in a rural hospital.

Methods:
This was a retrospective, quality improvement study performed at a single rural hospital, comparing patients diagnosed with pneumonia and treated with an anti-MRSA agent who were admitted from September to November 2021 (before implementation of the pharmacist-led MRSA swab protocol) to those admitted from September to November 2022 (post-implementation). The primary outcome was time to de-escalation of unnecessary anti-MRSA therapy, defined as number of days of anti-MRSA therapy per 1000 patient days. Secondary outcomes include mean days of therapy per patient, incidence of acute kidney injury, estimated hospital cost, hospital length of stay, in-hospital mortality, 30-day readmission rate, and physician acceptance rate of de-escalation requests. Patients were included if they were at least 18 years old, were diagnosed with pneumonia, were started empirically on anti-MRSA agents (i.e., vancomycin, linezolid) and either no respiratory cultures were obtained or respiratory cultures were negative for MRSA. Exclusion criteria included treatment with anti-MRSA agents for concomitant infections, immunocompromised state, or previous MRSA swab within 14 days.

Results:
A total of 100 admissions (50 per group) were included in this study. A significant reduction in mean days of MRSA therapy was identified in the post-implementation group (2.02 vs 2.70 days; $p = 0.0148$) but after adjusting per 1000 patient days, significance was lost (0.456 vs 0.532 days per 1000 patient days; $p = 0.118$). No statistically significant differences were found between groups for any secondary outcome, though the intervention group had numerically lower mean hospital costs and length of stay.

Conclusions:
While this study showed that a pharmacist-led MRSA nasal swab protocol created numerical improvements in multiple relevant outcomes, it failed to prove that these benefits were statistically significant. Nonetheless, the project increased awareness of the benefit of MRSA nasal swabs among staff and identified a trend of swabs being used inappropriately to rule in MRSA rather than rule it out.

The Impact of SyncPlus in an Independent Pharmacy

Miranda Cain, PharmD-PGY1 Community-based Pharmacy Resident at
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Taylor Bormann, PharmD Candidate; Kaity Brosnahan, PharmD Candidate; Cynthia Kryc, RPh;
Jennifer Rodis, PharmD, FAPhA

UAN: 0048-0000-23-027-L04-P

Learning Objectives:

1. Recognize what a medication synchronization program is, and it's benefit to patients
2. Differentiate SyncPlus from other medication synchronization programs
3. Identify the impact on workflow efficiency after implementation of SyncPlus

Purpose:

The purpose of this project is to evaluate changes in pharmacy workflow, volume of deliveries, and patient medication-related interventions following implementation of a medication synchronization program, SyncPlus.

Methods:

For SyncPlus, eligible patients must fill all their prescription medications at Crosby's Drugs and take at least five chronic medications. To enroll in the program, patients will provide verbal consent which can be documented in their respective electronic record. Verbal consent from patients will allow Crosby's Drugs' team to automatically refill medications that are due, contact patients' prescribers, and reach out to patients for MTM services. A three-month retrospective chart review will be performed before and after SyncPlus implementation to evaluate the impact of the program. The impact of SyncPlus will be measured by tracking program enrollment via internal reports. Internal reports in addition to Outcomes™ data will also report the number of completed medication reviews and medication adherence or safety opportunities addressed. Pharmacy data will provide the number of deliveries as well as the number of prescriptions delivered each month.

Results:

Results will address stated objectives.

Conclusions:

This evaluation will describe the SyncPlus program and demonstrate the impact of a medication synchronization program on an independent community pharmacy setting to guide similar practice sites considering this type of program implementation.

Developing a robust mental well-being program for pharmacy residents

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Deanna J. Fliehman, Pharm.D., BCPS

UAN: 0048-0000-23-028-L04-P

Learning Objectives:

1. Review the potential causes and evidence for pharmacy residents experiencing burnout
2. Identify opportunities to reduce burnout and improve resilience among pharmacy residents

Purpose:

Burnout is characterized by emotional exhaustion, depersonalization, and low sense of personal accomplishment on the job. Burnout has been shown to have many negative effects on patient care including medication errors, increased infection, and mortality. Clinicians of all kinds, including pharmacists and pharmacy residents have been experiencing high rates of burnout. In 2019, St. Elizabeth Healthcare developed a Mental Well-Being Program for pharmacy residents. The main goals of the program were to increase awareness of mental health and to provide residents with confidants. Through this program we implemented three strategies: resident mentors; monthly residency program director and resident one-on-ones; and optional Employee Assistance Program counseling sessions. In 2022, the American Society of Health-System Pharmacists (ASHP) updated the Accreditation Standard for Postgraduate Residency Programs requiring all programs to incorporate strategies for maintaining well-being and resilience, while also providing well-being and resilience resources to pharmacy residents and staff. The recent updates to the pharmacy residency standards prompted the need to evaluate the current Resident Mental Well-Being Program. The primary outcomes of this study are to identify gaps in St. Elizabeth Healthcare's Resident Mental Well-Being Program and to implement new mental well-being and resilience strategies for future pharmacy residents.

Methods:

A "Resident Stressor and Well-Bring Survey" was developed to compare resident mental well-being at St. Elizabeth Healthcare vs. a random sample of residents across the country. An assessment of the "Resident Stressor and Well-Being Survey" of the survey was completed to identify gaps in our current mental well-being and resilience strategies. Upon identification of the gaps, we will initiate several strategies to improve our Resident Mental Well-Being Program.

Results:

Results of the survey and strategies for improvement will be presented at the Ohio Pharmacy Resident Conference.

Conclusions:

Conclusions will be presented at Ohio Pharmacy Resident Conference

Effect of Marijuana Usage on International Normalized Ratio (INR) Time in Therapeutic Range

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Kathleen Babcock, PharmD, BCPS; Ally Schrock, PharmD, BCPS

UAN: 0048-0000-23-029-L05-P

Learning Objectives:

1. Discuss the proposed mechanism of the interaction between marijuana and warfarin
2. Describe the correlation between INR time in therapeutic range and marijuana usage

Purpose:
Marijuana is documented in the literature to have a drug-drug interaction via CYP2C9 inhibition. This interaction has been reported in an in vitro study and 4 case reports, but there is no data on its effect on the chronic management of warfarin. This quality improvement project aimed to evaluate the correlation between marijuana usage and warfarin INR time in therapeutic range (TTR) within the Summa Health Anticoagulation Management Service (SAMS) clinic to determine if a marijuana screening question should be incorporated into standard visits.

Methods:
This single-center, retrospective quality improvement project identified patients on warfarin managed by the SAMS clinic for greater than 3 months and had a visit during October 2022. The primary outcome was time in therapeutic range in patients that self-reported marijuana usage compared to patients that did not. Exclusion criteria included pregnant patients, patients < 18 years of age, and patients with a planned warfarin therapy interruption for a scheduled procedure or per physician instructions. Patients were also excluded if they declined to answer the screening question. Outcomes were compared using an independent t-test for parametric continuous outcomes and a chi-squared test for nominal outcomes.

Results:
A total of 612 patients were screened for data collection, and 111 patients met exclusion criteria. Of the 501 patients analyzed, 50 patients endorsed marijuana usage. After adjusting for differences in baseline characteristics, the use of marijuana was correlated with a -5.49% TTR (95% CI -9.35 – (-1.62)) P = 0.005 compared patients who did not endorse marijuana usage.

Conclusions:
The usage of marijuana was associated with a decrease in TTR. This data supports the implementation of a marijuana screening question at the SAMS clinic.

Assessing the patient referral acceptance rate following community health care screenings utilizing the layered learning model

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Bella Mehta, PharmD, FAPhA; Max Conrad, PharmD, MS; Erin Blank, RPh, PharmD; Tera Mendoza, RPh, PharmD; Kayla Pauley Lemaster; Brienna Garber; Nikhita Nakka

UAN: 0048-0000-23-030-L04-P

Learning Objectives:

1. Discuss the importance of following up with patient identified as hypertensive or hyperglycemic
2. Explore the use of the layered learning model in an outpatient setting

Purpose: Current literature lacks evidence to suggest patients participating in community screenings will follow up with health care professionals if identified as hypertensive or hyperglycemic. In addition, there are few studies involving the layered learning model in community health screenings. The primary purpose of this study is to assess the referral acceptance rate by patients indicated for an intervention following a community health screening by student pharmacists and a pharmacy resident and the secondary purpose is to assess perspectives of student pharmacists on participating in the layered learning model.

Methods:
Results of participants including blood pressure and blood glucose from community health screenings that were held in supermarkets of a large community pharmacy chain were reviewed by the research team to contact patients via phone calls to determine if they accepted their referral recommendation. Outcomes include whether participants have accepted their referrals with an outside provider. Additionally, volunteer student pharmacists were surveyed to assess their perspectives on the layered learning model at the community health screenings. Statistical methods will include descriptive analysis for analyzing patient referral acceptance and the one way ANOVA test for analyzing survey results.

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

Conclusions:
Final results and conclusions will be presented at the Ohio Pharmacy Residency Conference.

Evaluation of Adjusted Body Weight-Based Dosing of Unfractionated Heparin in Obese Patients for the Treatment of Acute Venous Thromboembolism

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UAN: 0048-0000-23-031-L01-P

Learning Objectives:

1. Review current literature and practice guideline recommendations for dosing strategies of IV unfractionated heparin in obese patients for the treatment of acute venous thromboembolism
2. Discuss the controversies regarding weight-based dosing and the use of dose capping of IV unfractionated heparin in obese patients

Purpose:

Standardized heparin-dosing protocols and weight-based nomograms have been implemented in various institutions for the treatment of acute venous thromboembolism. Controversies exist regarding weight-based dosing and the use of dose capping of unfractionated heparin in morbidly obese patients. The purpose of this study is to determine the rate of achievement of target activated partial thromboplastin time (aPTT) within 24 hours in morbidly obese versus non-morbidly obese patients using the Detroit Medical Center High Dose Nomogram for intravenous heparin. An optimal dosing protocol for intravenous heparin will be determined in morbidly obese patients (BMI ≥ 40 kg/m^2) for the indication of acute venous thromboembolism.

Methods:

This study will be conducted through a retrospective chart review of existing electronic medical records from July 2021 to July 2022. The study group will include morbidly obese patients defined as a BMI $\geq$ 40 kg/m^2 or a total body weight $\geq$ 150 kg. The control group will include non-morbidly obese patients defined as a BMI < 40 kg/m^2 or a total body weight < 150 kg. The primary endpoint is defined as attainment of aPTT or heparin assay in the target range within 24 hours of the initiation of continuous infusion heparin in morbidly obese versus non-morbidly obese patients. Secondary endpoints include hours to reach target aPTT or heparin assay, infusion rate in units/kg required to attain target aPTT or heparin assay, bleeding events, and thrombotic events. Inclusion criteria will include adult patients aged $\geq$ 18 years, patients admitted to a DMC hospital, and patients who received continuous infusion unfractionated heparin for $\geq$ 24 hours for the indication of acute venous thromboembolism using the existing DMC High Dose Nomogram. Exclusion criteria will exclude use of any other heparin dosing nomogram (low dose, routine dose, physician dosing, hypothermia), pregnant or lactating patients, patients receiving continuous renal replacement therapy (CRRT) or extracorporeal membrane oxygenation (ECMO), burn patients, and patients with Raynaud's phenomenon.

Results:

Results will be presented at the 2023 Ohio Pharmacy Residency Conference.

Conclusions:

Conclusions will be presented at the 2023 Ohio Pharmacy Residency Conference.

Treatment Duration for Gram-Negative Bloodstream Infections with Nephrolithiasis/Urolithiasis

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UAN: 0048-0000-23-032-L01-P

Learning Objectives:

1. Describe the pathophysiology of nephrolithiasis/urolithiasis and risk of infection recurrence
2. Select an appropriate duration of therapy for gram-negative bloodstream infection (GN-BSI)

Purpose:
There is minimal data regarding optimal duration of therapy in gram-negative bloodstream infections (GN-BSI) with obstructing nephrolithiasis/urolithiasis. Prescribing practices typically include a standard antibiotic duration (fixed duration with an antibiotic free period prior to stone management) or extended duration (continuous antibiotics until definitive stone management) with limited data supporting a particular strategy. This study investigates outcomes comparing standard versus extended duration of antimicrobial therapy in patients with GN-BSI with obstructing nephrolithiasis/urolithiasis.

Methods:
This Institutional Review Board approved, single-health system, two hospital retrospective cohort study screened patients treated between 1/1/2016 and 1/1/2022. The standard duration group included patients with an antibiotic free period ≥7 days before definitive stone management. Extended duration group included patients with continuous use of antibiotics until definitive stone management. The primary outcome was infection recurrence before definitive stone management. Select secondary outcomes included revisit to care, antimicrobial resistance, and mortality. Continuous data utilized a t-test or Mann-Whitney U test and categorical data utilized either Chi-square or Fisher's exact test.

Results:
After screening 416 encounters, there were 39 standard and 29 extended group patients. Most patients (94%) had urolithiasis and the most common pathogens were Enterobacterales (94%). Median antibiotic duration in days was 16 (15 – 19) vs. 19 (16 - 23), p=0.066. Time to definitive stone management varied between groups, 52 (34 – 71) vs. 22 (34 - 71) days, p=0.001. Infection recurrence occurred in 2 patients (5%) in the standard group and no patients in the extended group, p = 0.504. Revisit to care occurred in 28% (n=11) and 3% (n=1) respectively, p =0.009.

Conclusions:
This study did not show a statistical difference in infection recurrence between standard and extended group antibiotic duration strategies but was underpowered. Antibiotic durations in the standard group were longer than expected and the difference in time to definitive stone management may have influenced the primary outcome.

Evaluation of Diabetes Outcomes in a Pharmacist Managed Telephonic Clinic

Jordan Cloonan, PharmD – PGY1 Pharmacy Resident at MetroHealth Medical Center, Cleveland
Jordan Cloonan*, PharmD; Matthew Schneiderman, PharmD, BCACP; Christina Wadsworth, PharmD, MBA, BCPS; Julianna Leahy, PharmD, BCGP; David Gothard, MS; Brian Doss PharmD, BCGP

UAN: 0048-0000-23-033-L04-P

Learning Objectives:

1. Describe the workflow of a telemedicine collaborative pharmacist – nurse clinic in an underserved patient population
2. Evaluate if a collaborative pharmacist – nurse telemedicine clinic improves hemoglobin A1c (A1c) in patients with Type 2 Diabetes Mellitus (T2DM)

Purpose:
Telemedicine services leveraging interdisciplinary teams can improve diabetes outcomes. The aim of this study was to evaluate the clinical significance of telephonic interventions providing education, medication optimization, and lab monitoring in a collaborative pharmacist – nurse clinic. The primary outcome was to determine the change in A1c from baseline to 6 and 12 months after enrollment. Secondary outcomes included the percentage of patients meeting A1c performance metrics, number of patient interactions, patient demographics, social determinants of health variables, emergency department visits and hospitalizations, primary care provider (PCP) visits, and change in weight.

Methods:
A retrospective, single cohort pre/post telehealth intervention study was conducted on 1,149 patients with uncontrolled T2DM at a clinic within a large, disproportionate share health system. Pharmacists and nurses outreached patients with an outdated A1c or an A1c greater than 9%. Patients met inclusion if they had two or more encounters with clinic staff.

Results:
Of the 1,149 patients screened, 345 met inclusion criteria. Mean participant age was 59 years, 53% were female, and 49% identified as Black/African American. A significant reduction in A1c was found at both 6 and 12 months post-intervention, -2.0 and -2.4, respectively. At baseline, 21.7% of patients had an A1c less than 9%, improving at 6 and 12 months to 78.7% and 76%, respectively. Mean weight loss of 3.75 kg (SD 7.40) was observed from baseline to 12 months. No significant difference in hospitalizations or emergency department visits was found; however, there was a significant reduction in PCP visits.

Conclusions:
Implementation of a collaborative pharmacist – nurse telephonic clinic significantly improved A1c in a socioeconomically and demographically diverse patient population. Our findings suggest that proactive telephonic outreach can positively impact diabetes outcomes for patients regardless of race or gender. Health systems should leverage interdisciplinary teams to provide medication titration, education, and lab monitoring at individualized frequencies.

Evaluation of MRSA Nasal Swab Impact on Duration of Anti-MRSA Therapy in Pneumonia

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UAN: 0048-0000-23-034-L01-P

Learning Objectives:

1. Recognize the utility of MRSA nasal swabs (MRSA-NS) in pneumonia
2. Discuss the impact of timely MRSA-NS use on duration of anti-MRSA therapy

Purpose:
Methicillin-resistant Staphylococcus aureus (MRSA) represents a virulent cause of pneumonia. MRSA nasal swabs (MRSA-NS) test for nasal colonization with MRSA and have a high negative predictive value for MRSA pneumonia. Literature shows MRSA-NS use may shorten duration of anti-MRSA therapy, but few studies report length of therapy prior to ordering MRSA-NS. The objective of this study is to determine whether overall length of vancomycin or linezolid therapy differs significantly based on length of therapy prior to ordering MRSA-NS.

Methods:
Adult patients who received at least one dose of intravenous vancomycin or linezolid for pneumonia during inpatient admission at one of three hospital sites between 11/1/21-10/31/22 were included in this retrospective chart review. Patients were matched 2:1 by presence of MRSA-NS due to paucity of MRSA-NS use. The primary outcome was total duration of anti-MRSA therapy for pneumonia. An important secondary outcome included time from MRSA-NS order to result.

Results:
317 patients met criteria for analysis. Median duration of anti-MRSA therapy was significantly shorter with negative MRSA-NS vs sputum culture only (61.5 vs 75.6 hours, p = 0.021), as well as with all MRSA-NS and no MRSA-NS/culture vs sputum culture alone (67.9 vs 63.4 vs 93.7 hours, p=0.0208). Median time from starting anti-MRSA therapy to ordering MRSA-NS was 4 hours (minimum = -65.4, maximum = 239.7). Median time from order to result was significantly faster for MRSA-NS than sputum culture (35.3 hours vs 65.3 hours). With negative MRSA-NS, there was a direct correlation between length of time between starting the anti-MRSA therapy and ordering MRSA-NS vs duration of anti-MRSA therapy (correlation coefficient = 0.27, p=0.0094).

Conclusions:
Patients with MRSA-NS have significantly shorter duration of anti-MRSA therapy, with significantly shorter time from order to result likely contributing. Shorter time to ordering MRSA-NS also independently correlated with shorter duration of anti-MRSA therapy.

Impact of an Alcohol Withdrawal Order Set on Prescribing Practices

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UAN: 0048-0000-23-035-L01-P

Learning Objectives:

1. Describe the role of clinical informatics on patient care
2. Discuss how a standardized order set may impact prescribing patterns
3. Identify factors that could affect prescribing practices

Purpose:
Order sets are helpful clinical decision support tools within the electronic medical record. They are designed to encourage the use of evidence-based medicine by directing prescribers to a list of treatments for specified disease states. This multi-hospital health system implemented a standardized "Complicated Clinical Institute Withdrawal Assessment (CIWA) ≥15, alcohol withdrawal syndrome (AWS)" order set that incorporated both phenobarbital (PHB) and benzodiazepine (BZD) treatment options. Prior to order set optimization, PHB was excluded from AWS order sets. The purpose of this study was to evaluate the impact of a new, standardized order set on PHB and BZD prescribing rates.

Methods:
A retrospective chart review was performed on hospitalized patients 18 years and older who received at least one dose of either PHB or BZD from an AWS order set or order panel between May 1, 2021 and May 31, 2022. Patients were divided into groups based on the source of PHB order.

Results:
There was no difference in PHB prescribing rates before (pre) and after (post) order set implementation (66.4% vs. 66.7%; p=0.94). Cumulative PHB and lorazepam doses as well as ICU LOS were statistically significantly lower in the post-implementation group. No statistically significant differences were detected in cumulative diazepam dose, hospital LOS, adjunctive dexmedetomidine utilization, rate of intubation, and 30-day readmission.

Conclusions:
The hypothesis was that PHB prescribing rates would increase after PHB was incorporated into the standardized order set, however, no difference was detected. These findings may be a result of suboptimal provider education, lack of provider involvement in the informatics build process, and a disease state focus where optimal prescribing habits already exist. Despite the lack of difference found in this study, order set development may still be a beneficial effort in healthcare informatics, given there is adequate education and stakeholder involvement upfront.

Pharmacist impact on optimization of guideline-directed medical therapy in hospitalized patients with heart failure

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UAN: 0048-0000-23-036-L01-P

Learning Objectives:

1. Outline the quality improvement initiative protocol for initiation, titration, switching, and safety of GDMT in hospitalized patients with HFrEF ≤ 40% (Stage C)
2. Discuss successes and barriers encountered throughout the quality improvement initiative

Purpose:

The 2022 American Heart Association/American College of Cardiology guideline for the management of heart failure recommends the simultaneous initiation of guideline-directed medical therapy (GDMT) in hospitalized patients with heart failure reduced ejection fraction (HFrEF) ≤ 40% (Stage C). Use of all four drug classes has been estimated to reduce all-cause mortality by 73% compared with no treatment. Clinical pharmacists can play a key role in the optimization of patient medication regimens and can serve as an educational resource to providers regarding the safety of quadruple therapy initiation and titration.

Methods:

This is a quality improvement initiative that aims to address a gap in both the implementation and optimization phases of GDMT for hospitalized patients with HFrEF ≤ 40% (Stage C). The medication regimens of all adult patients with HFrEF ≤ 40% hospitalized from October 1, 2022 to March 31, 2023 will be evaluated by a clinical pharmacist and assessed for optimization. All clinical pharmacist interventions will be documented electronically and will include intervention recommendation, intervention rationale, and intervention acceptance or rejection. The primary outcome measure is identification of the value of having a clinical pharmacist on the patient care team for HFrEF patients through quantification of interventions made. Secondary outcome measures include assessment of medication regimens upon discharge for appropriate optimization of GDMT in HFrEF patients, barriers that were encountered, and safety data regarding in-hospital initiation of quadruple therapy.

Results:

Results of this study will be presented at the Ohio Pharmacy Resident Conference on May 25, 2023.

Conclusions:

Conclusions of this study will be presented at the Ohio Pharmacy Resident Conference on May 25, 2023.

Implementing Technology in Pharmaceutical Care

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UAN: 0048-0000-23-037-L04-P

Learning Objectives:

1. Discuss importance of technology use in healthcare
2. Explain the Health Information Technology Acceptance Model (HITAM)
3. Evaluate factors influencing blood sugar tracker app use

Purpose:

The COVID-19 pandemic significantly disrupted primary care. Providers and patients had to learn how to provide and receive healthcare virtually. Use of technology in healthcare enhanced patient engagement during the pandemic. Specifically, self-management is considered the most important factor in ensuring well-controlled blood glucose levels in patients with diabetes. Current research has established that apps are feasible tools to improve self-management of diabetes. Pharmacists can utilize healthcare apps to virtually manage patients' diabetes to improve convenience and clinical care for non-CGM users. The objective of this study is to evaluate the effects of specific technological interventions on patient engagement at a federally qualified health center in Ohio.

Methods:

Consenting diabetic patients managed under collaborative practice agreement at one clinic location will be trained to use a cloud-based blood glucose tracker to allow for remote monitoring of blood sugars. A verified theoretical framework will be used to qualitatively analyze the patients' experience using the blood sugar tracker: Health Information Technology Acceptance Model (HITAM). Interview questions will be derived from this model to assess patients' perceived usefulness of the blood sugar tracker app.

Results:

TBD

Conclusions:

TBD

Clinical Utility of Nasal MRSA PCR in Patients with Skin and Soft Tissue Infections: A Diagnostic Tool to Facilitate Antimicrobial Stewardship

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UAN: 0048-0000-23-038-L01-P

Learning Objectives:

1. Describe appropriate use of nasal MRSA PCR screening for patients with pneumonia
2. Discuss the potential utility of nasal MRSA PCR screening for patients with skin and soft tissue infections

Purpose:
Nasal Methicillin resistant Staphylococcus aureus (MRSA) polymerase chain reaction (PCR) screening has widely been studied for use in pneumonia to de-escalate antibiotics. There is limited data to support the use of nasal MRSA PCR screening in infections other than pneumonia. This study sought to determine the clinical utility of nasal MRSA PCR screening to predict the presence or absence of MRSA in cultures for patients with skin and soft tissue infections (SSTI).

Methods:
The primary outcome was the negative predictive value (NPV), positive predictive value (PPV), sensitivity, and specificity of the nasal MRSA PCR test for SSTI. The secondary outcome was to determine the same for several SSTI subtypes. Patients were identified for inclusion if they were over 18 years old, admitted with an SSTI diagnosis between January 2016 and July 2022, and had a resulted nasal MRSA PCR test and resulted cultures. Nasal MRSA PCR results were paired with culture results to determine the primary and secondary outcomes.

Results:
Out of 480 admissions reviewed, 153 admissions with resulted site cultures were included in the analysis. For the primary outcome, the NPV was 88.2%, PPV was 58.8%, sensitivity was 58.8 %, and specificity was 88.8%. For diabetic foot infections, the NPV was 97.4%, PPV was 88.9%, sensitivity was 88.9%, and specificity was 97.4%.

Conclusions:
There is likely low clinical utility for use of nasal MRSA PCR testing across all types of SSTI generally, however there may be clinical utility for use in diabetic foot infections.

Impact of Methicillin-resistant Staphylococcus aureus (MRSA) Polymerase Chain Reaction Nasal Swabs on the Duration of Vancomycin Therapy in Hospitalized Patients with Pneumonia

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UAN: 0048-0000-23-039-L01-P

Learning Objectives:

1. Discuss current antimicrobial stewardship strategies for de-escalating vancomycin for empiric MRSA pneumonia treatment at University Hospitals Ahuja Medical Center
2. Discuss results, next steps, and conclusions of the residency project

Purpose:

Vancomycin is a first line agent to treat MRSA pneumonia because it is bactericidal and cost effective. However, due to the risk of nephrotoxicity and other adverse effects associated with vancomycin, MRSA nasal screening, which has high negative predictive value of MRSA lung infections (99%), is routinely performed to de-escalate therapy. Historically, the nasal swab specimen was collected at the community hospital and transported to a tertiary care center for culturing. This process took an estimated 24 to 48 hours to provide results. MRSA polymerase chain reaction (PCR) is another option to process the same specimen as MRSA nasal culture but could be performed at the original site with an estimated time to result of about 12 hours. With the fast result, a negative MRSA PCR swab can be an important antimicrobial stewardship tool to stop unnecessary empiric anti-MRSA therapy. This retrospective chart review will aid in confirming the benefit of the recent implementation of MRSA PCR over traditional MRSA culture.

Methods:

This is a retrospective chart review, IRB-approved study looking at 2 cohorts: pre and post MRSA PCR implementation. Patients will be included if they have vancomycin – Pharmacy to dose with pneumonia as the indication and a negative MRSA PCR or culture. The primary endpoint is the duration of vancomycin therapy. The secondary endpoint for this study is the rate of AKI and time to MRSA nasal swab result. Data analysis will be performed using descriptive statistics for both primary and secondary endpoints.

Results:

Out of 151 patients evaluated (83 MRSA culture and 64 MRSA PCR), the mean duration of vancomycin therapy for MRSA culture and MRSA PCR are 3.18 days (SD 1.58) vs. 1.80 days (SD 0.95) respectively.

Conclusions:

Discussion of the results and statistical analysis will be presented at the 2023 Ohio Pharmacy Residency Conference.

Effect of Fidaxomicin versus Oral Vancomycin on *Clostridioides difficile* Infection Recurrence

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UAN: 0048-0000-23-040-L01-P

Learning Objectives:

1. Recall medications most likely to precipitate a CDI
2. Discuss the Infectious Diseases Society of America updated CDI guidelines

Purpose:

The Infectious Diseases Society of America and Society for Healthcare Epidemiology of America released updated guidelines for the management of *Clostridioides difficile* infections (CDI) in adults recommending the use of fidaxomicin as first-line therapy for both initial and recurrent CDI (rCDI). Recurrent CDI is expected to occur more frequently with patients treated initially with oral vancomycin than patients treated initially with fidaxomicin based on review of primary literature. This study will evaluate the effectiveness of the current practices at TriHealth for CDI and rCDI to determine if a change to fidaxomicin as first-line therapy is warranted.

Methods:

This retrospective, matched cohort study was approved by the institutional review board. Patients were identified using electronic medical records and stratified into two arms: those who received oral vancomycin ≥125 mg four times daily for 10 days and those who received fidaxomicin 200 mg twice daily for 10 days for CDI. Inclusion criteria include adult patients with a confirmed diagnosis of CDI whose therapy was initiated as an inpatient within the TriHealth system. Patients whose treatment regimen was changed during the course of a single infection, were treated with prophylaxis dosing, or patients who developed recurrence of infection within two weeks after treatment completion were excluded from this study. Patients will be assessed for initial medication used to treat CDI and medication(s) used to treat subsequent infections. The primary objective is to assess recurrence of CDI at four weeks after completion of therapy. Secondary outcomes include hospital length of stay, development of fulminant CDI, and mortality at 30 days. It was determined that 120 patients per treatment arm would provide 80 percent power to detect a difference of 15 percent between groups for the primary outcome.

Results:

Data collection is complete; analysis is in progress.

Conclusions:

Final conclusions and discussion will be presented at the 2023 Ohio Pharmacy Resident Conference.

Determining the Association between Grocery Nutrition Scores and Number of Medications Taken for Metabolic Syndrome

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UAN: 0048-0000-23-041-L04-P

Learning Objectives:

1. Review metabolic syndrome and its treatment
2. Understand the components of grocery nutrition scores
3. Determine whether grocery nutrition scores are correlated to the number of medications patients take for metabolic syndrome

Purpose:

Metabolic syndrome is a cluster of disease states that increases an individual's risk of developing diabetes or cardiovascular disease. When treating metabolic syndrome, lifestyle and diet are primary areas for interventions, however these diets do not often have a quality index associated with them for nutritional value. A dietician-led grocery nutrition system that scores patient's purchases may correlate to better control of metabolic health, as shown by the number of medications taken for metabolic syndrome.

Methods:

This retrospective cohort study compared patients' five-month average grocery nutrition scores to the number of medications taken for metabolic syndrome conducted at one pharmacy in a large community pharmacy chain with Institutional Review Board approval. Data was collected from May 2022 to March 2023. Patients were included if they were 18 years or older, were an established patient at the pharmacy where the study is being conducted and purchased most of their groceries at the location with a shopper's loyalty account. The primary outcome was a comparison of the average number of medications taken for metabolic syndrome to grocery nutrition scores at or above goal to those below goal as pre-defined by a dietician team.

Results:

A total of 40 patients were enrolled in this study. The average number of medications patients took for metabolic syndrome was 1.29 for those with grocery nutrition scores at goal compared to 1.88 for those with grocery nutrition scores below goal ($p=0.214$). The number of medications patients took for hypertension was 1 for the at goal group and 1.08 for the below goal group ($p = 0.807$). For diabetes, patients at goal took an average of 0.07 medications and 0.42 below goal ($p = 0.083$). For dyslipidemia, patients at goal took an average of 0.21 medications and 0.38 for those below goal ($p = 0.467$). And for weight loss patients took an average of 0 and 0.04 medications for at goal and below goal groups respectively ($p = 0.463$). The total number of medications taken for any disease was also evaluated with patients at goal taking an average of 4.29 medications and those below goal taking 6.73 medications ($p = .138$).

Conclusions:

There is no statistical difference in the number of medications patients take for metabolic syndrome based on their grocery nutrition scores. Technology was a limiting factor in enrollment and ultimately, the study did not meet power.

Evaluation of Venous Thromboembolism (VTE) Prophylaxis Practices in Trauma Patients at a Large Community Teaching Hospital

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UAN: 0048-0000-23-042-L01-P

Learning Objectives:

1. Understand the unique pathophysiology of venous thromboembolism risk in trauma patients
2. Evaluate differences between national guidelines regarding venous thromboembolism prophylaxis in trauma patients
3. Identify the importance of early venous thromboembolism prophylaxis in trauma patients

Purpose:

Patients who experience a traumatic injury are at higher risk of developing a VTE early in their hospital course due to hypercoagulability, venous stasis, and endothelial injury. Initiation of VTE prophylaxis following a traumatic injury should be administered as soon as possible but may differ from patient to patient depending on patient- specific injuries and need for surgery. National guidelines make recommendations for early versus delayed VTE prophylaxis therapy depending on the mechanism of injury. Our study seeks to characterize prescribing practices for VTE prophylaxis in trauma patients at our institution and to evaluate the safety and efficacy of enoxaparin and heparin therapy for VTE prophylaxis in trauma patients.

Methods: This was a single center, retrospective, observational study. Participants were included if they were aged 18 years or older, had an admission due to any trauma related injury, were hospitalized for at least 72 hours, and had an injury severity score (ISS) greater than nine. Participants were excluded if they were pregnant, on an anticoagulant prior to admission, received any VTE prophylaxis agents other than enoxaparin or heparin, had a history of heparin induced thrombocytopenia (HIT), were transferred to another facility within the first 72 hours of admission, had a hospital length of stay less than 72 hours, transitioned to comfort measures or expired within the first 72 hours of admission. The primary outcome was to identify the percentage of trauma patients initiated on VTE prophylaxis and characterize prescribing practices of enoxaparin and heparin at our institution. The secondary outcomes included incidence of new VTE, major bleed, and characterization of any anti- Factor Xa level monitoring.

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

Conclusions: Final conclusions will be presented at the Ohio Pharmacy Residency Conference

Evaluating the Impact of Consultant Pharmacist-Assisted Heart Failure Management in the Skilled Nursing Setting

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Learning Objectives:

1. Discuss the prevalence of Heart Failure in the US
2. Determine the Impact of Consultant Pharmacist-Assisted Heart Failure Management in the Skilled Nursing Setting

Purpose:

In the United States 6.2 million adults have a diagnosis of Heart Failure (HF). Of these individuals, 85% occur in the Medicare beneficiary patients who are over 65 years of age. This study was aimed at evaluating the impact of a consultant pharmacist (HF) management program in reducing HF exacerbations and readmission rates. Secondarily, this study assessed the number of patients receiving Guideline-Directed Medical Therapy (GDMT) and rate of acceptance for HF-related recommendations.

Methods:

A HF medication management protocol was previously implemented as part of routine care by consultant pharmacists at multiple Skilled Nursing Facilities (SNFs). Patients were identified for study inclusion via electronic health records at time of monthly chart review. Inclusion criteria were patients 65 years of age and older with a diagnosis of HF documented in their medical records and classified as long-term stay patients. Appropriate management of HF therapy was based on the most recent American College of Cardiology (ACC)/American Heart Association (AHA) HF guidelines. Patients were re-evaluated monthly to assess impact of consultant pharmacist interventions. Data collection was completed September 2021 through February 2023

Results:

Of the 100 patients currently enrolled in the study, 18% of patients received GDMT prior a pharmacist's intervention. Sixty-four recommendations on 100 patients were submitted to PCPs with a 43.7% (28) acceptance rate. Recommendations written based on medication classes were the beta blockers (58%), ACEi/ARB (37%) and SGLT2i (5%) respectively.

Conclusions:

Without pharmacist intervention, less than one in five patients with HF failure living in a SNF would receive GDMT. The number of patients receiving GDMT can be improved with the inclusion of pharmacy services in HF management.

Health System Specialty Pharmacist Intervention in Multiple Sclerosis

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Learning Objectives:

1. Review current literature describing pharmacist's role in the treatment of patients with multiple sclerosis (MS)
2. Identify the types and outcomes of interventions completed by clinical pharmacists for patients with MS in a health system specialty pharmacy
3. Analyze outcomes data to identify where pharmacists make the most impact in patients with multiple sclerosis and opportunities for the future

Purpose:
Health system specialty pharmacy (HSSP) pharmacists play an integral role in multiple sclerosis (MS) patient care by facilitating medication access, providing counseling, improving adherence, and decreasing provider workload. However, current literature detailing pharmacist interventions and their acceptance rates in this population is limited. The purpose of this study is to identify the types and outcomes of clinical interventions completed by pharmacists for patients with MS (PwMS).

Methods:
This is a retrospective, multi-center, observational, descriptive study conducted from October 2019-August 2022. The study included patients 18 years or older diagnosed with MS being managed by the HSSP with at least one completed intervention and on a disease modifying therapy (DMT). Interventions were documented under the following categories: Adherence, Adverse Drug Reaction (ADR), Drug Information, Hospitalization, Lab, Referral of Service, Regimen, or Vaccine. Each intervention type was separated into the reason for intervention, recommendation from the pharmacist, and the outcome. Adherence was reported using the average Percentage of Days Covered (PDC).

Results:
For 225 patients enrolled in HSSP services, a total of 449 interventions were completed with an average of 2.00 interventions per patient. Most interventions identified were associated with medication adherence (28.73%), regimen (27.62%), adverse drug reaction (ADR) (20.71%), and laboratory (15.14%). The average adherence was 94%, as defined by Proportion of Day Covered. The most common recommendations were to continue therapy (14.92%), schedule labs (12.69%), and follow up with providers (11.80%). Recommendations resulted in the following outcomes: accepted (85.30%), declined (3.79%), and required follow up with providers (10.91%).

Conclusions:
Pharmacists impact patient outcomes through the completion of clinical interventions that improve adherence, identify regimen problems, manage ADRs, and coordinate proper labs. Pharmacist recommendations were most often accepted for interventions related to regimen and ADRs. Proper identification and management of regimen concerns, as well as tolerability of medications, can positively impact adherence and improve overall patient outcomes.

Evaluation of the impact of new injectable specialty medications being introduced to the market on ambulatory care pharmacy workflow

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UAN: 0048-0000-23-045-L04-P

Learning Objectives:

1. Identify barriers that could be encountered when a new medication is introduced to market that is able to be covered by both medical and pharmacy benefits.
2. Describe a process for steps to take to improve access to medications in the case that a new injectable medication is introduced to the market and is able to be covered by both prescription and medical benefits.

Purpose:

Since the introduction of inclisiran (Leqvio®) to the market in 2021, pharmacists have been struggling to navigate the most appropriate way of billing for the injectable medication. This is a medication used to lower low density lipoprotein (LDL) cholesterol in patients at higher risk of experiencing an atherosclerotic cardiovascular event. However, unlike PCSK9 inhibitors, this medication must be administered by a healthcare provider. Therefore, inclisiran (Leqvio®) can be billed through either medical benefits insurance or prescription benefits insurance. This difference in billing process poses a challenge to pharmacists and providers ordering the medication as they are not able to easily identify which benefit plan would provide the prescribed medication to the patient at the lowest cost.

This session aims to identify the obstacles providers, pharmacists, and pharmacy technicians have encountered with the introduction of the new injectable medication, inclisiran (Leqvio®). It will also outline possible opportunities to ease the implementation of services for new injectable medications that may be billed via medical or pharmacy benefits to provide the medication to the patient at the lowest possible cost in a timely manner.

Methods:

The study has been approved by the Institutional Review Board. This retrospective review will be used to analyze obstacles that providers and pharmacists have encountered with the introduction of the new injectable medication, inclisiran (Leqvio®). All patients who either filled inclisiran (Leqvio®) at the St. Elizabeth Specialty Pharmacy and/or who were referred to the St. Elizabeth Medication Management Clinic (MMC) for hyperlipidemia management with inclisiran (Leqvio®) were included in the study. Data collection included: patient demographics, prescription and medical benefit insurance information, cost of inclisiran (Leqvio®) copay, obstacles that have been encountered when billing medication from the pharmacist's perspective.

Results:

Final results will be presented at the Ohio Pharmacy Resident Conference.

Conclusions:

Conclusions will be presented at the Ohio Pharmacy Resident Conference.

Impact of a Pharmacy-Led Transitions of Care Service in a Psychiatric Population

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UAN: 0048-0000-23-046-L05-P

Learning Objectives:

1. Describe the processes involved in pharmacy-led transitions of care.
2. Report the pharmacy interventions made during this project.

Purpose:
Previous quality improvement (QI) projects at Summa Health demonstrated the benefits of pharmacy transitions of care (TOC) interventions on decreasing hospital readmission rates. The objective of this project was to expand pharmacy-led TOC services to a psychiatric population and determine the impact on 30-day readmission.

Methods:
This prospective QI project involved implementing a pharmacy-led TOC process at Summa Health St. Thomas Campus on a psychiatric unit from December 13th to December 30th 2022. TOC interventions were completed upon admission and discharge for new admissions and excluded if admitted to intensive care. Interventions included an admission adherence screen, medication history and reconciliation upon admission and discharge. The primary outcome was 30-day readmission of the prospective cohort compared to 30-day readmissions of the prior year using a Fisher's exact test. Patients directly discharged and readmitted to main campus were not included in the readmission data. Descriptive statistics were used for secondary outcomes which included TOC interventions and adherence barriers.

Results:
In December 2022, 42 patients were interviewed and 3 were readmitted within 30 days. In December 2021, 100 patients were admitted to the same unit and 3 patients were readmitted within 30 days (7.1% vs. 3%; p=0.346). In the prospective cohort, 6 received a full admission and discharge intervention, 35 received a partial- admission intervention, and 1 received a partial discharge intervention. On average 2.8 medication changes were made per patient. The most commonly identified adherence barrier was side effects. TOC interventions were provided for 18 patients (42.9%). Common TOC interventions included providing a Medicaid transportation number, checking OARRS, and calling pharmacies or provider offices for medication histories.

Conclusions:
Pharmacy-led TOC intervention did not show a reduction in 30-day readmission within a psychiatric population. TOC interventions were received by 42.9% of patients, suggesting opportunity to provide targeted intervention to this population.

Evaluating the Impact of an Outpatient, Pharmacist-Led, Long-Acting Injectable Clinic Using Naltrexone for Alcohol Use Disorder

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Masa Scott, PharmD, BCPS, BCPP

UAN: 0048-0000-23-047-L01-P

Learning Objectives:

1. Recognize the available FDA approved medications for alcohol use disorder
2. Assess the impact of a pharmacist led long-acting injectable clinic
3. Evaluate if a patient is appropriate to receive long-acting injectable naltrexone

Purpose:

To initiate and preliminarily evaluate a pharmacist run, outpatient long-acting injectable clinic using naltrexone for alcohol use disorder with a collaborative practice agreement at Mercy Health St. Charles Behavioral Health Institute. With this study, we hope to lift the workload on nursing personnel and increase patients' access to care. Initially, this clinic will work solely with extended-release injectable naltrexone (Vivitrol) for alcohol use disorder, with hopes to later expand to administer all long-acting injectable medications including antipsychotics.

Methods:

This study is a quality improvement opportunity and will be conducted at the Mercy Health St. Charles Behavioral Health Institute. Patients with alcohol use disorder who meet inclusion criteria will be referred to the study by a physician and evaluated for appropriateness of use of long-acting naltrexone. The pharmacist will collect information regarding patient demographics, amount of alcohol consumption and duration of use as well as lab tests performed at appropriate intervals through a collaborative practice agreement. This information will be used by the pharmacist to guide treatment decisions and appropriate follow up with the patient. The primary outcome is to distinguish a change in the number of drinking days and the quantity of alcohol a patient consumes. Secondary endpoints include patients' compliance with long-acting naltrexone and patients' assessment of satisfaction with their clinic visit and having a pharmacist readily available.

Results:

Results are on-going

Conclusions:

NA

Stratifying Risk for Postoperative Severe AKI (POSAKI) in Patients Undergoing Open Heart Surgery

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Learning Objectives:

1. Understand the risk factors associated with post-operative severe AKI in cardiac surgery patients
2. Understand the associated morbidity/mortality of post-operative severe AKI in cardiac surgery patients

Purpose:
Patients undergoing cardiac procedures are at risk for developing acute kidney injury (AKI) at a reported incidence of 20-40%. Most described risk factors are related to overall AKI risk and are not independently studied for association with severity. This study aims to determine independent risk factors for postoperative severe AKI (POSAKI) in patients undergoing open heart surgery.

Methods:
We conducted a retrospective study of adult patients who underwent open-heart surgery at Corewell East (March 2019-January 2022). Patients who met inclusion criteria were stratified into group 1 (cases with POSAKI) and group 2 (control without POSAKI). We used descriptive statistics to compare perioperative factors. Multivariate linear regression was used to determine the association between perioperative factors and POSAKI.

Results:
Our study population included 150 patients who underwent open heart surgery, 50 with POSAKI and 100 without POSAKI. Age (median 67.1) and gender (26.6% female) were similar in both groups. Risk factors associated with POSKI include BMI>30 (62% vs 44%, p=0.037) heart failure (44% vs 24%, p=0.012), peripheral arterial disease (PAD) (22% vs 6%, p=0.003), leukocytosis >11 bil/L (26% vs 12%, p=0.03), preoperative hemoglobin <12.5 (66% vs 46%, p=0.02), cardiopulmonary bypass time >140 minutes (14% vs 4%, p=0.03), and post-operative hypotension (70% vs 25%, p<0.0001). PAD (odds ratio (OR) 9.45; confidence interval (CI) [2.2-40.56], p=0.002), hemoglobin<12.5 (OR 5.92; CI [2.03-17.26], p=0.001), BMI>30 (OR 2.64; CI [1.04-6.68], p=0.04), and postoperative hypotension (OR 14.36; CI [4.97-41.44], p=<0.001) were independently associated with POSAKI. POSAKI was associated with increased mortality (32% vs 0%, p<0.001) and increased length of stay (median 21 days vs 7 days, p<0.001)

Conclusions:
In patients undergoing open heart surgery, preoperative hemoglobin<12.5g/dL, BMI>30, postoperative hypotension, and history of PAD were all independently associated with an increased risk of POSAKI.

Gap analysis of the technician staffing model using technician perceptions to guide optimization and improve job satisfaction

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UAN: 0048-0000-23-049-L04-P

Learning Objectives:

1. Discuss current literature surrounding pharmacy technician staffing shortages
2. Describe implications of survey and focus group results for pharmacy technician job optimization and satisfaction

Purpose:
National and state level surveys seeking to capture driving forces for pharmacy technician shortages have revealed concerns for increased workload, decreased staffing, and decreased job satisfaction. To date, little data has been published regarding opportunities for optimization of pharmacy technician shortages. The purpose of this quality improvement project is to use technician perceptions to identify components of distributive technician workflow that can be optimized for improved satisfaction and retention.

Methods:
This prospective, quality improvement project used survey methodology and qualitative analysis of focus groups was approved by the OhioHealth Institutional Review Board as a quality improvement determination and was conducted in concert with pharmacy technician staff from OhioHealth Grant Medical Center. An anonymous survey was administered to assess four domains targeting areas for pharmacy technician job satisfaction. The survey identified key opportunities for optimization including but not limited to job workload, nonmonetary options for job incentivization, drivers for staff retention, and perceptions of the current pharmacy technician role. The primary outcome measure was indicators of pharmacy technician staff satisfaction and retention. Descriptive statistics were used to summarize survey data collected and focus groups were assessed qualitatively.

Results:
16 pharmacy technician survey responses were collected. Four focus groups were conducted. The primary outcome results indicated shift length as an area for optimization of job satisfaction and retention. Focus group data indicated pay, work schedule, and work-life balance as pharmacy technician driven indicators for staff retention.

Conclusions:
Likert survey and focus group results identified opportunities for pharmacy technician workflow optimization to improve job satisfaction. Opportunities for change include change in hours worked per shift.

Retrospective Analysis of Vancomycin and Fidaxomicin for the Treatment of Recurrent *Clostridioides difficile* Infection

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Learning Objectives:

1. Review guideline recommendations for pharmacological treatment of recurrent *C. difficile* infection
2. Evaluate the effectiveness of three different pharmacologic treatment strategies for recurrent *C. difficile* infection

Purpose:

Clostridioides difficile (*C. difficile*) is a spore-forming, gram-positive, anaerobic bacillus. *C. difficile* infection (CDI) is the most common cause of healthcare-associated infectious diarrhea in the United States.[1] CDI is a serious concern due to the potential development of complications such as sepsis, toxic megacolon, and death. The Center for Disease Control and Prevention (CDC) stated that in 2017, there were an estimated 223,900 hospitalizations and 12,800 deaths due to CDI in the United States.[2] A major challenge with the treatment of CDI is prevention of recurrences. The Infectious Diseases Society of America (IDSA) defines a recurrent case of CDI as an episode of symptom onset and positive assay result following an episode with positive assay result in the previous two to eight weeks.[3] The CDC estimates that one out of every six patients with a history of CDI will have a recurrence.[4] Guidelines for the management of recurrent CDI (rCDI) recommend the use of either fidaxomicin or oral vancomycin in a tapered or pulsed regimen.[3,5] The objective of this study is to evaluate clinical outcomes for three different pharmacological approaches for the treatment of rCDI.

Methods:

This is a multi-centered, retrospective cohort of patients who have had more than one episode of CDI. Data will be collected from five community hospitals across the northeast Ohio region. Inclusion criteria are adult patients who have received at least one dose of oral vancomycin or fidaxomicin for CDI and have had a positive stool assay for CDI from October 1st, 2021 to September 30th, 2022. Patients presenting with an initial CDI, who are pregnant, who experience in-hospital death prior to completion of prescribed antibiotic regimen, who are less than 18 years old, and who elect palliative or hospice care will be excluded. The primary outcome is the proportion of patients who develop rCDI at eight weeks. Secondary outcomes include time to recurrence, mortality, the proportion of patients with rCDI at three months and six months from starting therapy for CDI. Primary and secondary outcomes will be analyzed using ANOVA testing. A multi-variable regression analysis was performed to identify significant risk factors for rCDI.

Results: Data analysis is ongoing. Results and conclusions will be presented at the 2023 Ohio Pharmacy Resident Conference

Conclusion: Data analysis is ongoing. Results and conclusions will be presented at the 2023 Ohio Pharmacy Resident Conference

Comprehensive E-Consult Service at a Large Academic Health System

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Learning Objectives:

1. Recognize literature gaps in current pharmacist e-consult literature.
2. Analyze the results of e-consult acceptance rates when completed by expert pharmacists versus non-expert pharmacists.

Purpose:
E-consults have been utilized in healthcare systems by medical professionals. Pharmacy e-consults remain novel. Previous studies have shown benefit in the pharmacist's inclusion in niche e-consult programs. Additional research is required to fill literature gaps to assist in optimizing the pharmacist's role in these programs. This study investigated if there was a difference in the acceptance rate between e-consults answered by pharmacists who are experts in the e-consult disease state versus those who are not experts.

Methods:
This study was a retrospective review of all pharmacy e-consults completed by pharmacists at a large academic health system between March 1st, 2020, and August 31st, 2022. E-consults were identified using a report. Data collection points included e-consult disease state, ordering provider, pharmacists' specialty, and recommendation result. The primary outcome for this study was the difference in acceptance rates of expert versus non-expert pharmacist recommendations. Secondary outcomes included the overall implementation rate, acceptance rate between provider types, time to implementation, and pharmacist response time. Acceptance rates were compared between expert/non-expert dichotomy via Pearson chi-square test.

Results:
A total of 375 e-consults met inclusion criteria and spanned 19 unique disease states. The three most common included diabetes mellitus (27%), pain management (13.1%), and mental health (11%). Nearly 60% of e-consults were in a disease with an expert. The provider acceptance rate was higher when e-consult was completed by an expert versus non-expert (62.6% versus 39.6% respectively, $p = 0.002$). The overall implementation rate was 51.6%. Physicians accepted the pharmacist's recommendations 55.6% of the time, certified nurse practitioners (64.7%), physician assistants (100.0%), and other professionals (25.0%) ($p = 0.033$). Mean time to recommendation implementation was 16.5 days (SD = 29.4 days). Mean time to pharmacist response was 1.1 days (SD = 1.4 days).

Conclusions:
Comprehensive e-consult programs are more successful when integrating pharmacists with niche expertise.

Improving Treatment Through a Pharmacist Led Penicillin Allergy Delabeling Program

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Learning Objectives:

1. Review the importance of delabeling penicillin allergies
2. Explain the impact a pharmacist has on penicillin allergy delabeling

Purpose:

Penicillins (PCNs) are beta-lactam antibiotics and are first line treatment options for many infections such as: urinary tract, skin and soft tissue, surgical site, pneumonia, sinusitis, etc. Approximately 20% of patients at Southwest General (SWG) have a reported PCN allergy; however, literature reports less than 1% of the national population has a true allergy. The high incidence of reported PCN allergies limits the use of beta-lactam antibiotics leading to increased risk for treatment failure, adverse effects, increased length of stay, and increased antibiotic resistance. This project aims to determine if a pharmacist led PCN allergy delabeling program will improve standard of care treatment, improve clinical outcomes, and decrease antibiotic costs.

Methods:

This is an ambidirectional cohort study reviewing adult patients with a reported PCN allergy admitted to SWG for an infection. Data collection includes demographics, documented PCN reaction, infection type, antibiotic prescribed, antibiotic appropriateness, antibiotic cost, length of stay, infectious disease consult, and previous PCN use at SWG. Retrospective data was collected from inpatient admissions January 1, 2022 – March 31 2022. Starting January 1, 2023, the pharmacy department implemented an oral amoxicillin challenge program that was approved through Infection Control. With patient and physician consent, patients who met inclusion criteria were trialed with amoxicillin 500mg once, and monitored for four hours or until hospital discharge. Following test results, the PCN allergy documentation was updated, and treatment recommendations were made to the primary prescriber managing the infection as appropriate. A follow up phone call with patients was conducted seven to ten days after the challenge to ensure absence of delayed reactions. Additionally, an educational handout was provided to patients explaining the results of their amoxicillin challenge.

Results:

Final results will be presented at the 2023 Ohio Pharmacy Resident Conference.

Conclusions:

Conclusions will be presented at the 2023 Ohio Pharmacy Resident Conference.

Evaluation of Shortened Apixaban Loading Duration in Patients with Venous Thromboembolism Compared to Conventional Apixaban Loading Duration on Readmission Rates

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Learning Objectives:

1. Describe current apixaban prescribing patterns for VTE treatment and the impact on hospital readmission rates
2. Examine the impact of shortened duration apixaban load on mortality rates, length of stay, and readmission diagnosis

Purpose:

Patients with venous thromboembolism (VTE) are at increased risk for recurrent VTE, hemodynamic compromise, and mortality within the first five to ten days of the thromboembolic event. Recommended VTE treatment dosing of apixaban is 10mg twice daily for seven days followed by 5mg twice daily. Concern for over-anticoagulation exists when determining the appropriate duration of therapy for initial loading dose of apixaban following continuous infusion heparin administered for greater than 36 hours. The primary objective of this study was to evaluate readmission rates for patients who received a shortened duration of apixaban loading compared to patients receiving the conventional FDA approved dose.

Methods:

This study was a retrospective cohort analysis including patients admitted to University Hospitals Portage Medical Center and University Hospitals Geauga Medical Center from October 1, 2016 - October 31, 2022. Patients 18 years and older who received apixaban while admitted to University Hospitals with VTE diagnosis were included in this study. Patients were divided into two groups: patients who received the conventional initial treatment dosing of apixaban for seven days and patients who received less than seven days of conventional initial dosing. Patients were excluded from the study for chronic nonsteroidal anti-inflammatory drug therapy, mechanical heart valve, antiphospholipid syndrome, or Childs Pugh Class C. Patients on apixaban for atrial fibrillation, birth control, high dose aspirin >165mg daily, strong inducers of CYP3A4, or dual antiplatelet therapy were also excluded. The primary endpoint was the readmission rate of patients for VTE within 90 days of their primary VTE event. Primary endpoint was examined using a chi-square test. Secondary endpoints included evaluation of patient demographics, the cost of therapy, bleeding risk, mortality rate, ED/Urgent care visits, time to follow- up with cardiology, and payer type. Secondary endpoints were examined using a survival analysis for bleeding risk or mortality, and descriptive statistics for all other endpoints.

Results:

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

Conclusion:

To be presented at the 2023 Ohio Pharmacy Residency Conference.

Utilization of Pneumonia Order Set and Impact on Patient Outcomes

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Learning Objectives:

1. Review current empiric antibiotic prescribing patterns for patients admitted for community acquired pneumonia (CAP)
2. Evaluate the impact of using a pneumonia order set on empiric CAP antibiotic prescribing practices

Purpose:

Community acquired pneumonia (CAP) is the most common lower respiratory tract infection. The Trinity Health Pneumonia Order Set (POS) has defined antibiotics options to aid in therapy selection for patients admitted with CAP. The primary objective was to evaluate if utilization of the POS increases utilization of standard empiric CAP antibiotics.

Methods:

Patients included in this retrospective chart review were adults admitted to Mount Carmel Health System (MCHS) hospitals between 1/1/22-6/30/22 diagnosed with bacterial CAP and started on intravenous antibiotics. Patients were excluded if concomitant infections were present. The primary endpoint was the empiric antibiotic prescribing pattern for providers. Secondary endpoints included additional antibiotics ordered, readmissions at 30 days, total antibiotic duration, length of stay, unit of stay, prescribing service, and pathogens identified through cultures. Descriptive statistics were used for demographic data. Fisher's exact and Wilcoxon rank sum tests were used for bivariate analyses. Logistic regressions were used to assess the impact of certain factors on ordering patterns.

Results:

213 patients met criteria for this analysis, with POS used in 113 (53.1%) of cases. Providers using POS were more likely to choose ceftriaxone plus azithromycin as empiric coverage than providers ordering antibiotics outside POS (73.5% vs 51%, p=0.001) and were less likely to choose piperacillin/tazobactam (9.7% vs 28%, p=0.0007). Empiric guideline-directed antibiotic use was associated with significantly lower total duration of all antibiotics (8.5 vs 9.9 days, p=0.0280).

Conclusions:

Utilization of POS resulted in more frequent ordering of antibiotics considered standard empiric regimens by national and local guidelines. Use of standard empiric antibiotics were also associated with shorter lengths of therapy. Providers ordering antibiotics outside POS were more likely to initiate broad-spectrum coverage, particularly piperacillin/tazobactam. Increased utilization of POS for initiating antibiotics may help align prescribing patterns with empiric CAP guideline recommendations.

Safety and Efficacy of Two Intravenous Digoxin Loading Dose Strategies

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Learning Objectives:

1. Review the two dosing strategies of digoxin loads used for rate control in atrial fibrillation, atrial flutter, or supraventricular tachycardia.
2. Describe the incidence of digoxin toxicity and identify independent risk factors for toxicity.

Purpose:
Conflicting recommendations exist between the American College of Cardiology/American Heart Association atrial fibrillation (AF) guidelines and digoxin package insert for digoxin loading dose regimens. This study aimed to evaluate if a weight-based dosing (WBD) versus a fixed dosing (FD) strategy influenced the incidence of toxicity, in-hospital mortality, or rate control in patients with acute AF, atrial flutter, or supraventricular tachycardia.

Methods:
This was a retrospective cohort study of adult patients presenting to a 1,101-bed academic medical center between 1/1/2020-6/30/2022 who received an intravenous digoxin load for rate control. Primary endpoints included incidence of composite toxicity (nausea, vomiting, vision changes, or new onset arrhythmias within 48 hours of digoxin load) and in-hospital mortality. Secondary endpoints included time to rate control (< 110 bpm after initiation of digoxin load) and serum digoxin concentration (SDC) drawn > 8 hours from load completion. The two comparator arms of WDB and FD were determined by dividing the total loading dose received (mcg) by the patient's ideal body weight. A cutoff point of 12 mcg/kg was used as it is the upper limit of the WBD recommendation.

Results:
A convenience sample of 250 patients was randomly selected from the 736 patients that met the study criteria (157 in the FD group and 93 in the WBD group). Composite toxicity occurred in 23.6% of patients in the FD group and 33.3% in the WBD group (p= 0.498). In-hospital mortality was similar between the two groups (p=0.712). Rate control was achieved in 64.8% of all patients at 6 hours. Mean SDC in the FD group was higher at 1.25 +/- 0.79 ng/mL when compared to SDC of 1.0 +/- 0.72 ng/mL in the WBD group (p=0.210).

Conclusions:
There was no difference in composite toxicity, in-hospital mortality, or time to rate control between IV digoxin loading dose strategies.

Pharmacy Sustainability: Reduction of paper processes within a large community hospital

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Learning Objectives:

1. Discuss workflows within pharmacy operations that are reliant on paper processes
2. Outline a rubric designed to identify the feasibility to adapt workflows to prioritize sustainability

Purpose:

United States healthcare facilities produce a daily average of 14,000 tons of waste, which has encouraged healthcare systems to dedicate resources to support sustainability efforts. The primary purpose of this study is to identify opportunities within pharmacy workflows for reductions in paper usage. The secondary purpose is to evaluate opportunities for sustainable workflow changes and cost savings.

Methods:

This is a prospective observational quality improvement study at a 1,060-bed tertiary care community hospital that evaluated our medication use processes to assess the use of paper within the pharmacy department. A survey was used to gather data from frontline staff on paper processes within the central pharmacy operations. Data points were scored using a rubric and graphed on a Possible Implement Challenge Kibosh (PICK) chart to assess opportunities to reduce or eliminate paper processes. The rubric includes criteria evaluating estimated time to change, cost to change, technological requirements to change, regulatory parameters, workflows impacted, departments impacted, and volume of waste reduction. Additionally, the results were assigned a subjective multiplier to account for estimated pushback from the department.

Results:

The survey had 43 completions which resulted in the identification of 68 unique paper processes. Data graphed on the PICK chart demonstrates processes in the following sectors: 13(54%) in implement, 3(12.5%) in probable, 1(4%) in challenging, and 1(4%) in kibosh, additionally 6(25%) processes bordered the implement and probable sectors.

Conclusions:

The rubric was successful in evaluating our ability to change paper processes within central pharmacy workflows. Next steps will be to implement changes to the identified paper processes within the department of pharmacy that were deemed feasible by the rubric. The project has started a focus within the department to find creative ways to reduce the use of paper.

The Impact of Buprenorphine Induction for Opioid-Use Disorder on Emergency Department Visits

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Learning Objectives:

1. Describe the role of buprenorphine for opioid use disorder
2. Discuss the rates of return to the emergency department following buprenorphine induction for opioid use disorder and apply the information to clinical practice

Purpose:

About 200,000 emergency department (ED) visits in the United States in 2016 were due to opioid-related overdose. One of the most safe and effective therapies for opioid use disorder (OUD) is buprenorphine. The purpose of this study is to assess the effect of buprenorphine induction therapy in the ED for OUD on rates of emergency department visits and admissions.

Methods:

This study is a single-center retrospective chart review. One cohort of patients acts as its own control group. The index ED visit is the initial buprenorphine induction for OUD in the ED between May 1, 2020 and March 1, 2022. The comparison groups are six months before and six months after the index visit. Criteria for inclusion were adults with a primary ED reason for visit involving OUD, treated with buprenorphine, and an admission diagnosis of acute or chronic opioid dependence, withdrawal, or misuse. Exclusion criteria included pregnancy, imprisonment, death within the study period, and a refill of buprenorphine within six months before the index visit. The primary outcome is the incidence of total ED visits and hospital admissions for OUD.

Results:

Fifty-one patients met inclusion criteria. The incidence of total ED visits due to OUD before vs. after buprenorphine induction was 14 vs. 21 respectively (p=0.33). Upon further analysis, the incidence of visits due to opioid withdrawal before and after was 8 vs. 5 (p=0.41) and overdose 6 vs. 8 (p=0.6). Following the index visit, some patients returned to the ED seeking buprenorphine refills (0 vs. 8 (p=0.1)). Subgroup analysis was performed comparing patients who refilled buprenorphine to those who did not. The change in ED visits before and after buprenorphine induction was assessed. There was a nonsignificant decrease in visits due to opioid withdrawal for those who refilled vs. no refill (-3 vs. 0; p=0.81). Additional subgroup analysis compared those who received >8 mg/day of buprenorphine during the index visit vs. ≤8 mg/day. Those who received >8 mg/day had a declined trend in visits due to opioid withdrawal vs. ≤8 mg/day (-5 vs. 2; p=0.21) and an increased trend of visits for a buprenorphine refill (6 vs. 2; p=0.64).

Conclusions:

There was an increased trend of ED visits for OUD following buprenorphine induction in the ED. Upon analysis, however, this increase was due to buprenorphine refill requests. These results may suggest there could be barriers to receiving a refill, and strategies to improve access to outpatient buprenorphine should be assessed. Induction with >8 mg of buprenorphine in the ED caused a decline in rates of subsequent ED visits due to opioid withdrawal and an increase in visits for buprenorphine refills.

Safety and Efficacy of DOACs in Atrial Fibrillation Patients with Extremely Low Body Weight

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Learning Objectives:

1. Review anticoagulation recommendations for patients with atrial fibrillation
2. Evaluate the safety of apixaban vs rivaroxaban in atrial fibrillation patients with an actual body weight (ABW) $\leq$60 kg and/or a body mass index (BMI) $\leq$18.5 kg/m^2

Purpose:
Published literature assessing the safety of direct oral anticoagulants (DOACs) in patients with very low body weight is sparse. Majority of the recent literature has been limited to small sample sizes in the Asian patient populations in Korea. The aim of our study was to assess the safety of apixaban and rivaroxaban in a larger population of atrial fibrillation patients with low body weight.

Methods:
This retrospective multicenter, single health system cohort study included patients that were at least 18 years old with a diagnosis of nonvalvular atrial fibrillation (NVAF) and treated at a system facility between November 1, 2016 and September 30, 2022. Patients were required to be treated with apixaban or rivaroxaban for their NVAF. Patients were also required to have an ABW $\leq$60 kg and/or BMI $\leq$18.5 kg/m^2 at the time of DOAC initiation. Patients were followed from the date of documentation of apixaban or rivaroxaban initiation through the discontinuation date of the DOAC or one year, whichever came first. The primary outcome was the incidence of clinically relevant non-major bleeding (CRNMB). Secondary outcomes included the incidence of major bleeding, incidence of major thromboembolic events, and incidence of all-cause mortality.

Results:
169 patients were included in the study. 85.2% of patients were treated with apixaban for their NVAF, with 59% of those patients being on the reduced dose of 2.5 mg twice daily. The incidence of CRNMB was not significantly different between patients on apixaban and patients on rivaroxaban (22.2% vs 28%; p = 0.527). There was a significantly lower incidence of major bleeding in patients on apixaban versus rivaroxaban (4.9% vs 16%; p = 0.037). There was no significant difference in Incidences of ischemic stroke, transient ischemic attack (TIA), or all-cause mortality. There were no incidences of systemic embolism, deep vein thrombosis (DVT), or pulmonary embolism (PE).

Conclusions:
Our study suggests that apixaban is safer than rivaroxaban for atrial fibrillation patients with very low body weight regarding risk of major bleeding, but that neither agent is significantly safer regarding risk of CRNMB. The study also suggests that both apixaban and rivaroxaban are similarly efficacious in this patient population regarding incidence of major thromboembolic events.

Allopurinol for tumor lysis syndrome prevention: fixed dose versus weight-based dose

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Learning Objectives:

1. Review current guideline and evidence-based recommendations for allopurinol dosing for tumor lysis syndrome prevention.
2. Describe current prescribing practices for allopurinol in tumor lysis prevention at OhioHealth Riverside Methodist Hospital.
3. Identify opportunities for improvement for patients at high risk of tumor lysis syndrome at OhioHealth Riverside Methodist Hospital.

Purpose:
Tumor lysis syndrome (TLS) is an oncological emergency that, if not treated promptly, can lead to end organ damage, arrhythmia, and death. Allopurinol has shown benefit in preventing TLS in intermediate to high-risk patients. There is a lack of evidence evaluating the different dosing regimens that are used in the literature and in practice.

Methods:
This retrospective, single-center, chart review evaluates patients on allopurinol for TLS prophylaxis. Patients at high-risk of TLS with their first cycle of chemotherapy given at Riverside Methodist Hospital (RMH) between July 1, 2015 and August 1, 2022 were eligible. Patients were excluded with CrCl < 60 mL/min, administration of rasburicase prior to chemotherapy and insufficient laboratory values to assess TLS in the 48 hours after chemotherapy. Those eligible were distributed into two groups based on their BSA of ≤ 1.97 m^2 or > 1.97 m^2. The primary outcome was development of TLS.

Results:
Of the 55 patients included, the primary outcome was not met patients in any patients in the BSA of ≤ 1.97 m2 group and 2 patients in the BSA > 1.97 m2 (p=0.21). All patients in both groups were ordered allopurinol prior to chemotherapy; however, 86.66% and 96.54% were administered allopurinol prior to chemotherapy in the BSA of ≤ 1.97 m2 group and BSA > 1.97 m2, respectively (p=0.61). Uric acid levels differed between the two groups, 3.77± 2.11 in the BSA of ≤ 1.97 m2 group and 5.04 ± 1.86 in the BSA > 1.97 m2 group (p=0.004).

Conclusions:
A flat dose of allopurinol 300 mg daily may be adequate prevention for TLS in high-risk patient's during their first cycle of chemotherapy. During patient selection, it was identified that there is an opportunity for more consistency amount TLS lab ordering and monitoring during an inpatient chemotherapy admission.

Assessing the Impact of Pharmacist-Initiated MRSA Nasal PCR Protocol on De-escalation of Vancomycin in Non-Purulent Cellulitis

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Learning Objectives:

1. Summarize the literature findings that support the utilization of S. aureus nasal PCR test in non-purulent cellulitis
2. Identify the potential benefit in implementing a pharmacist-initiated S. aureus nasal PCR protocol for non-purulent cellulitis infections

Purpose:
Non-purulent cellulitis (NPC) is a common infection in hospitalized patients. Although it is rarely caused by Staphylococcus aureus (S. aureus), vancomycin is prescribed more frequently than preferred beta-lactam therapy. The S. aureus nasal PCR is a highly sensitive test with utility in ruling out methicillin-resistant S. aureus (MRSA) infections. In August 2021, a pharmacist-initiated S. aureus nasal PCR protocol was implemented to promote vancomycin de-escalation in NPC. The purpose of the study was to evaluate the impact of the protocol on vancomycin use and patient outcomes.

Methods:
This was an IRB-approved, quasi-experimental study of adult patients admitted to Corewell Health Dearborn Hospital for NPC who received at least one dose of vancomycin. Patients were stratified into two arms: admission between October 2019-March 2020 (pre-implementation arm) and admission between October 2021-July 2022 (post-implementation arm). The primary endpoint was difference in vancomycin duration of therapy. Secondary endpoints included LOS, incidence of vancomycin-associated nephrotoxicity (VAN), estimated cost savings, and difference in vancomycin de-escalation.

Results:
A total of 96 patients were included. No statistically significant difference was seen in duration of vancomycin therapy between the pre- and post-implementation arms (80.6 vs 64 hours, P=0.134). There was no statistical difference in LOS (5 vs. 4 days, P=0.906), VAN (2 vs. 2 patients, P=1.000), estimated cost per patient ($90.49 vs. $67.68, P=0.103), and appropriate vancomycin de-escalation (30% vs. 36%, P=0.19). Average time to vancomycin de-escalation from negative PCR result was 27 ± 30.5 hours.

Conclusions:
S. aureus nasal PCR testing is a potentially useful tool for de-escalation of vancomycin in NPC. Although we detected no statistical differences in our outcomes, this could likely be due to lack of timely follow-up and intervention on negative PCR results. The numerical differences in our outcomes may suggest clinical benefit with proper utilization of this tool, and statistical significance may be seen with reinforcement of protocol adherence. Further studies are needed to re-assess outcomes following pharmacist and provider education.

Impact of Staphylococcus Aureus Nasal Screening on Antimicrobial Therapy in Non-Purulent Skin and Soft Tissue Infections

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UAN: 0048-0000-23-061-L01-P

Learning Objectives:

1. Review the available literature on the use of the MRSA nasal PCR in SSTIs.
2. Discuss the impact of a pharmacist-driven MRSA nasal PCR protocol in patients with non-purulent SSTIs.

Purpose:
Our institution implemented a pharmacist-driven protocol to screen patients with non-purulent skin and soft tissue infections (SSTI) initiated on vancomycin for methicillin-resistant *Staphylococcus aureus* (MRSA) utilizing a MRSA nasal polymerase chain reaction (PCR). The high negative predictive value of the MRSA nasal PCR in pneumonia has been established in literature, but there is limited clinical data in non-purulent SSTIs. The purpose of our study was to determine the impact of a MRSA nasal screening protocol for non-purulent SSTIs on patient outcomes.

Methods:
This was a retrospective review of adult patients with non-purulent SSTIs admitted from either January 1, 2021 through June 30, 2021 (pre-protocol implementation) or January 1, 2022 through June 30, 2022 (post-protocol implementation) who received intravenous vancomycin. Patients with septic shock, necrotizing fasciitis, orbital/periorbital cellulitis, or received vancomycin for a concomitant infection were excluded. Inferential and descriptive statistics were utilized for analysis.

Results:
A total of 102 patients were included in the pre-implementation group and 101 in the post-implementation group. Baseline characteristics were similar between groups. The median duration of anti-MRSA therapy in hours in the pre-implementation group was 140.9 hours and 98 hours in the post-implementation group (p-value= 0.1912). The median time to vancomycin de-escalation was 60.1 hours in the pre-implementation group and 41.1 hours in the post-implementation group (p= 0.1432). The rate of anti-MRSA therapy de-escalation was lower in the pre-implementation group (37.3%) than the post-implementation group (50.5%) (p-value= 0.0573). In a subgroup analysis of MRSA nasal PCRs run on a weekday, the median duration of anti-MRSA therapy was 93.3 hours (p value=0.1072).

Conclusion:
This study demonstrated a reduction in the total duration of anti-MRSA therapy, less time to vancomycin de-escalation, and higher rates of anti-MRSA therapy de-escalation in patients with non-purulent SSTIs after implementation of a pharmacist-driven MRSA nasal screening protocol.

Efficacy of Nebulized Heparin for the Treatment of Inhalation Injury

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UAN: 0048-0000-23-062-L01-P

Learning Objectives:

1. Evaluate current evidence of inhaled heparin for the management of inhalation injury
2. Compare and contrast the outcomes in the literature to those measured at a Certified Burn Center

Purpose:

Inhalation injury is present in around 10% to 33% of burn patients. Inhalation injury comes from thermal and chemical injury, as a result of inhaled steam, smoke, and other chemicals leading to direct cell damage and pulmonary dysfunction. Inhaled heparin is theorized to reduce fibrin casts physically obstructing the airway and prevent further formation. Standard treatment involves supportive care. Current data on the use of inhaled heparin is limited and conflicting regarding its clinical benefit. The purpose of this study is to assess clinical and safety outcomes of using nebulized heparin to treat inhalation injury.

Methods:

This is a retrospective, quasi-experimental study of adult patients diagnosed with inhalation injury from January 1, 2010 to December 31, 2022. Included patients will be mechanically ventilated adults with inhalation injury admitted to the Burn service. Excluded patients will be those who have Total Body Surface Area (TBSA) burns > 60%, expired within 72 hours of admission, not mechanically ventilated or for < 24 hours, received nebulized heparin for < 24 hours, history of a heparin allergy, or pregnant. The primary outcome will be 28-day mechanical ventilator free days. Secondary outcomes include 7-day extubation rate, ICU and hospital length of stay, in-hospital mortality, discharge disposition, incidence of ventilator associated pneumonia (VAP), and time to development of VAP. Those that did receive nebulized heparin will be stratified based on dose given. The safety outcome will be rate of bleeding events, which are defined as any bleed leading to a drop in hemoglobin more than 2 g/dL or requiring transfusion of packed red blood cells.

Results:

Results will be presented at the 2023 Ohio Pharmacy Residency Conference.

Conclusions:

Discussion of the results and statistical analysis will be presented at the 2023 Ohio Pharmacy Residency Conference.

Impact of Pharmacist Intervention on COPD Readmission and Patient Health Outcomes

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UAN: 0048-0000-23-063-L04-P

Learning Objectives:

1. Demonstrate different pharmacy interventions that may improve COPD readmission rates in a rural hospital setting.
2. Describe techniques used to improve patient health outcomes such as inhaler adherence, inhaler technique and rescue inhaler usage.

Purpose:

Chronic obstructive pulmonary disease (COPD) exacerbations are one of the leading causes of hospital readmission in the US. Several studies across the globe have shown significant improvement in inhaler technique and adherence following pharmacist intervention but have failed to assess the effect of these interventions on readmission to the hospital. The purpose of this project is to analyze the impact of pharmacist intervention on COPD readmission through Global Initiative for Chronic Obstructive Lung Disease (GOLD) guideline staging, evaluation of inhaler technique and adherence, and rescue inhaler utilization at baseline compared to follow-up.

Methods:

This study will be a single-center, retrospective and prospective chart review evaluating outcomes before and after the implementation of pharmacist-driven COPD interventions including disease staging, medication appropriateness, inhaler technique, medication adherence, and rescue inhaler usage. Patients ≥18 years of age, admitted with a COPD exacerbation, admitted with a complication of a COPD exacerbation (pneumonia, acute hypoxemic respiratory failure, bronchitis, emphysema, or other respiratory infection), and the ability to answer questionnaires in English will be included. Patients with severe dementia or Alzheimer's, on hospice, diagnosed with lung cancer, or on a lung transplant list will be excluded. Data will be collected through retrospective chart review between 12/01/2021 and 03/31/2022. Retrospective data will include disease staging and COPD medication appropriateness. Data will be collected through prospective chart review and pharmacist intervention from 12/01/2022 through 3/31/2023. During the prospective period, patients will be interviewed by a pharmacist to collect the patient's modified Medical Research Council (mMRC) dyspnea score, COPD Assessment Test (CAT) score, current COPD medication regimen, baseline inhaler technique, COPD medication adherence, and rescue inhaler utilization. Readmission data will be analyzed within retrospective and prospective study periods to assess the effect of pharmacist intervention. Secondary outcomes will include emergency room visits without hospitalization, change in inhaler technique, COPD regimen adherence, and rescue inhaler utilization from baseline.

Results:

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

Conclusions:

The results of this study will provide valuable insight into the factors that may contribute to COPD exacerbations and readmissions in patients at a rural, community hospital. The study may contain certain pharmacist interventions that can be utilized full-time at Aultman Alliance Community Hospital, and possibly at other affiliate hospitals (Aultman Hospital, Aultman Orrville Hospital).

The Safety and Efficacy of Dalbavancin for the Treatment of Spinal and Paraspinal Infections

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UAN: 0048-0000-23-064-L01-P

Learning Objectives:

1. Describe the efficacy of dalbavancin for the treatment of spinal and paraspinal infections
2. Describe the safety of dalbavancin for the treatment of spinal and paraspinal infections

Purpose:
Dalbavancin, a long-acting lipoglycopeptide, is FDA-approved for acute bacterial skin and skin structure infections. Current literature supports off-label dalbavancin for osteomyelitis of peripheral bones, but limited evidence exists to support its use for vertebral osteomyelitis (VOM) and paraspinal infections (PSI). This study sought to describe the safety and efficacy of dalbavancin for spinal and PSIs.

Methods:
This multicenter, retrospective cohort study included adult patients treated with either dalbavancin or standard of care (SoC) between January 2018 and September 2022 for any of the following diagnoses: VOM, discitis, epidural abscess, psoas abscess, intramedullary abscess, or other infections involving the paraspinal musculature. Patients were excluded if they were immunocompromised or cultures grew only Gram-negative or anaerobic organisms. The primary outcome was treatment success (TS) at 90 days, and secondary outcomes included infection progression, infection relapse, infection recurrence, infection-related re-admission, and adverse reactions (ADR).

Results:
Twenty-nine patients (10 dalbavancin, 19 SoC) were included. Baseline characteristics were similar in the dalbavancin and SoC groups, with the exception of intravenous drug use (70% vs. 15.8%, P = 0.01) and diabetes (0% vs. 42.1%, P = 0.026), respectively. Vancomycin and daptomycin were used most often for empiric Gram-positive coverage. TS occurred in 2 (20%) dalbavancin and 9 (47.4%) SoC patients (P = 0.23). Treatment failure due to relapse (20% vs. 26.3%, P = 1.0) and progression (10% vs. 15.7%, P = 1.0) was similar between groups. There were no differences in infection recurrence or infection-related re-admission. Fewer patients in the dalbavancin group experienced ADRs (10% vs. 47.4%) and discontinued treatment due to an ADR (0% vs. 31.6%).

Conclusions:
Patients treated with dalbavancin for VOM and PSIs had numerically lower incidence of TS compared to SoC recipients. Dalbavancin was well tolerated and led to numerically less treatment discontinuation than SoC therapies. Larger, prospective analyses are needed to confirm these findings.

Safety and Efficacy of Colchicine Dose Adjustments for Pericarditis Treatment in Patients with Renal Insufficiency and/or Interacting Medications

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UAN: 0048-0000-23-065-L05-P

Learning Objectives:

1. Review current guidance for dose adjustments of colchicine in pericarditis
2. Discuss how dose adjustments may affect the efficacy and safety of colchicine treatment

Purpose:
Colchicine plays a key role in the anti-inflammatory management of pericarditis. There is a lack of guidance in the current literature for adjusting doses of colchicine for pericarditis in patients with impaired renal function or who are taking interacting medications. This study aimed to determine whether dose adjustments of colchicine in patients with pericarditis were safe and effective.

Methods:
This was an IRB-approved retrospective chart review evaluating patients with first-episode pericarditis from February 2020 to September 2022. To be included in the study, patients must have received colchicine for the treatment of pericarditis and had a CrCl <30mL/min and/or were taking pre-defined interacting medications. Patients were divided into two groups for comparison: those receiving adjusted-dose colchicine or standard-dose colchicine. The primary efficacy outcome was colchicine treatment failure, defined as a composite of symptom persistence after 72 hours following colchicine initiation or requiring adjunctive therapy for pericarditis within 3 months. The secondary safety outcome was colchicine adverse effects, defined as a composite outcome of documented gastrointestinal intolerance within three months of starting colchicine or dose adjustment or cessation of colchicine due to adverse effects.

Results:
Eighty-three patients were included in this study (34 in the standard-dose group, 49 in the dose-adjusted group). For the primary outcome, treatment failure occurred in 38.2% patients with standard-dose colchicine and 38.8% of patients with dose-adjusted colchicine (p=0.960). There was a reduction in the number of patients with colchicine adverse effects (safety outcome): 38.2% of patients with standard-dose colchicine and 12.2% of patients with dose-adjusted colchicine (p=0.006).

Conclusions:
Colchicine adjusted for renal insufficiency and/or drug interactions did not significantly impact pericarditis treatment failure rates. However, there was a lower incidence of colchicine adverse effects in patients receiving dose-adjusted colchicine compared to standard-dose colchicine.

Assessment of steroid utilization throughout a community health system

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UAN: 0048-0000-23-066-L01-P

Learning Objectives:

1. Discuss the difference in steroid requirements between chronic obstructive pulmonary disease (COPD), inflammatory bowel disease (IBD), and rheumatic diseases.
2. Report percentages of patients receiving appropriate steroids.

Purpose:

Corticosteroids (steroids) are used in a variety of disease states, including chronic obstructive pulmonary disease (COPD), inflammatory bowel disease (IBD), and many rheumatic diseases. The anti-inflammatory effects of steroids make them a key component of many clinical practice guidelines. However, dose and duration of steroid use in inflammatory disorders is not clearly defined. The purpose of this study is to assess the use of corticosteroids in an inpatient setting throughout a community health system. Knowledge gained will be used to assist in the prescribing and de-escalation of steroids in the future.

Methods:

The study was approved by the Institutional Review Board. This retrospective study assessed steroid utilization prior to initiation of a steroid stewardship program within a community health system. Patients at least 18 years of age with COPD, ulcerative colitis, Crohn's disease, rheumatoid arthritis, psoriatic arthritis, lupus, ankylosing spondylitis, axial spondylarthritis, and/or gout will be included if they received at least 24 hours of steroids between July 1, 2021 and July 1, 2022. The following data will be collected: demographic data; length of admission; ordering physician and specialty; steroid indication, dose, route of administration, and duration; screening for osteoporosis (Dexa scan within the past year); presence of infection within 60 days of steroid initiation (defined as elevated white blood cell count, temperature greater than 100.4 degrees Fahrenheit). The primary outcome is to evaluate the number of patients appropriately receiving steroids per health system protocols or clinical practice guidelines. Secondary outcomes include number of patients with appropriate steroid taper length and/or de-escalation, osteoporosis screening post treatment, and hospitalization due to infection during steroid use.

Results:

Results will be presented at the Ohio Pharmacy Resident Conference

Conclusion:

Conclusions will be presented at the Ohio Pharmacy Resident Conference

Provider Perceptions of Clinical Pharmacy Services at Federally Qualified Health Centers in Ohio

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UAN: 0048-0000-23-067-L04-P

Learning Objectives:

1. Define the quadruple aim of healthcare
2. Review the current state of clinician burnout in primary care
3. Discuss the impact of clinical pharmacy services on provider satisfaction, well-being, retention, and patient care

Purpose:
Federally Qualified Health Centers (FQHCs) experience significant employee turnover resulting in decreased productivity, increased workload, and stress for remaining employees in an already resource-scarce setting. One factor of interest that impacts job engagement and well-being is interprofessional teamwork. Specifically, it has been demonstrated that clinical pharmacy services (CPS) positively affect providers' work-life; however, no studies have explored this relationship in FQHCs. This study assessed providers' satisfaction with CPS, perceptions of the impact of CPS on patient care and provider well-being, and the potential impact of CPS on provider retention.

Methods:
In the Fall of 2022, an anonymous survey was distributed via Qualtrics™ to non-pharmacist providers practicing at Ohio-based FQHCs with access to CPS. The survey consisted of 21 Likert scale, multiple choice, and free-response questions. Some survey questions were developed using published surveys as a template and others were created de novo based on pertinent factors within the current literature.

Results:
The survey was distributed to 205 providers, of which 50 responded (24% response rate). Over 82% of respondents were extremely satisfied with CPS. In perceptions of patient care, providers strongly agreed (86%) that removing or limiting access to CPS would negatively impact the quality of care to their patients. Providers noted that CPS positively impacted their well-being, specifically; contributing to a more manageable workload, increased professional development and continued learning, and allowing providers to focus on more professionally fulfilling tasks ($r= 0.86$; $p<0.001$). CPS positively impacted (83%) providers' likelihood of staying in their current position at their organization.

Conclusions:
With the degree of provider burnout in primary care, this study provides additional insight into providers' perceptions of the effect of interprofessional teamwork between primary care providers (PCP) and pharmacists in FQHCs. The results highlight PCPs' positive perceptions of the impact of CPS on patient outcomes, elements of provider well-being, and provider retention. These results should be utilized by FQHC leadership to understand the contributions of CPS to patient care and provider well-being and retention, which support the expansion of CPS at FQHCs.

Evaluation of an Outpatient Antimicrobial Stewardship Pilot Program

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UAN: 0048-0000-23-068-L04-P

Learning Objectives:

1. Discuss the progress of antimicrobial stewardship programs in the United States.
2. Review the CDC core elements of outpatient antimicrobial stewardship.
3. Recognize potential impact of outpatient antimicrobial stewardship program in an outpatient clinic setting.

Purpose:
The purpose of this quality improvement project was to complete a needs assessment of an outpatient antimicrobial stewardship pilot program within Internal Medicine Center (IMC) at Summa Health.

Methods:
A retrospective daily report of antimicrobial prescriptions written by Internal Medicine providers was generated from November 1st, 2022 through January 31st, 2023. Appropriateness of therapy was evaluated by a pharmacist. Patients who were ≥ 18 years with an active infectious diagnosis were included in the study. Data collected included antimicrobial prescribed, indication, dose, duration of therapy, and allergy history. Appropriateness of each data point was evaluated and tracked during the study period and was determined by utilizing current clinical guidelines. In addition, the pharmacist served as the prospective contact for all antimicrobial questions for IMC providers. Three antimicrobial-related educational sessions were completed for medical residents and attendings during the study period. The inpatient antimicrobial stewardship team was available for reference throughout the entire study period. Statistical analysis was completed using descriptive statistics.

Results:
301 oral antimicrobial prescriptions were reviewed by the pharmacist during the study period. Of these, 25.6% (n=77) were deemed inappropriate. Duration of antimicrobial therapy (n=38, 49%) and indication for antimicrobials (n=21, 27%) were the most common reasons for inappropriateness. The most common diagnosis associated with inappropriate therapy were urinary tract infections (n=16) and sinusitis (n=15). The pharmacist was proactively involved on 4 antimicrobial prescriptions, resulting in a 100% appropriateness rate.

Conclusions:
Current data shows that up to 50% of outpatient antimicrobial prescriptions in the United States are deemed unnecessary, suggesting that there is a need for an outpatient antimicrobial stewardship presence. Pharmacists can play a vital role in evaluating appropriate antibiotic use by integrating in the outpatient care team to provide education, such a targeted provider prescribing education, and recommendations on antimicrobial therapy. The primary limitation to this study was the retrospective nature of antimicrobial review and the limited presence of the stewardship team at time of prescribing. In the future, a study designed to embed an outpatient antimicrobial stewardship team in multiple clinic settings for all operational hours may be needed to full assess the impact of an outpatient stewardship program at Summa Health.

Ambulatory care pharmacist credentialing and privileging process within a medication management setting

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UAN: 0048-0000-23-069-L04-P

Learning Objectives:

1. Recognize the importance of pharmacist credentialing and privileging process within an outpatient clinic.
2. Discuss the pharmacist peer evaluation process through focused and ongoing professional practice evaluations.

Purpose:

Credentialing is a formal process in which qualifications and competency are demonstrated to ensure healthcare practitioners can provide appropriate patient care. While the Joint Commission sets these standards for physicians, nurse practitioners, and physician assistants, pharmacists do not have ubiquitous standards across all healthcare systems. For this reason, it is imperative health systems with pharmacists in expanded roles, such as within medication management clinics, implement processes to ensure their pharmacists are qualified and competent. With these expanded roles also comes increased liability, further necessitating formal credentialing and privileging.

Methods:

This quality improvement study consists of the creation of a policy detailing the process for credentialing and privileging pharmacists. The scope of the policy will cover pharmacists working within a medication management clinic operating with a collaborative care agreement. Under this policy, each pharmacist will complete a credentialing application that provides details on education, experience, licenses, certifications, and references. The pharmacist then applies for privileges, permitting the pharmacist to perform specific clinical duties. Pharmacists can apply for, and possess, multiple privileges. Privileges will be maintained through ongoing professional practice evaluations assessing clinical performance. After initial credentialing and privileging, recredentialing will be required every two years. This entails a reappraisal of credentials and will factor in performance reviews. The processes outlined within this policy will be reviewed and approved by the pharmacy leadership team and supervising physicians participating in the clinic's collaborative care agreements. This policy will be implemented as a pilot program, with the goal of future implementation throughout the health system.

Results:

Final results to be presented

Conclusions:

Final conclusions to be presented

Characterization of medication errors in the intensive care unit and the role of a pharmacist

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UAN: 0048-0000-23-070-L05-P

Learning Objectives:

1. Describe overall trends and identify the role of the pharmacist in identifying, reporting, and preventing medication errors in the intensive care unit (ICU)
2. Discuss implementation of the MRC-ICU scoring tool to prioritize pharmacist interventions

Purpose:
A medication error is any error, regardless of adverse consequences, that occurs in the medication use process. Patients in the ICU are at greater risk for experiencing a medication error and one strategy to prevent these errors is the involvement of a pharmacist in ICU care. The primary objective of this quality improvement project is to describe medication errors in the ICU and evaluate the role of the pharmacist in identifying, reporting, and preventing these medication errors. A secondary objective is to assess the impact of the Medication Regimen Complexity Scoring tool for the ICU (MRC-ICU) on the identification and evaluation of errors in critically ill patients.

Methods:
This was a retrospective chart review in adult patients at Cleveland Clinic Hillcrest Hospital from September 1, 2020 to September 30, 2022. Patients were included if they had a medication event reported through SERS while admitted to a critical care unit.

Results:
A total of 122 patients with 137 medication errors were included. The most common medication types associated with an error were antimicrobials (29.9%) and anticoagulants (10.9%). The majority of errors were associated with no harm (74.5%), while 15.3% of errors were associated with temporary harm. The steps in the medication use process where an error most frequently occurred were administering (38%), prescribing (20.9%), and monitoring (16.1%). The most common reporter of errors was a pharmacist (75.2%). A pharmacist had direct intervention in identifying or preventing a medication error in 76 (55.5%) of the reported errors. The median MRC-ICU score was 14 (IQR 9-18) in patients with errors associated with direct pharmacist intervention.

Conclusions:
Pharmacists play a crucial role in identifying, reporting, and preventing medication errors in the ICU. The MRC-ICU score may be beneficial to identify patients who are at an increased risk for experiencing a medication error due to medication regimen complexity.

Evaluating a Norepinephrine Dose Target to Guide Vasopressin Discontinuation in Septic Shock

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UAN: 0048-0000-23-071-L01-P

Learning Objectives:

1. Recall guideline recommended treatments for sepsis and septic shock
2. Review discontinuation of vasopressors in the recovery phase of septic shock

Purpose:
The 2021 Surviving Sepsis Campaign guidelines provide general guidance to initiate vasopressors during septic shock; however, recommendations for discontinuation during septic shock resolution are absent. Evidence from primary literature remains inconclusive due to various dosing strategies and study protocols employed. The purpose of this study was to address this knowledge gap by evaluating a specific norepinephrine dose target to guide vasopressin discontinuation during septic shock resolution.

Methods:
This was a single-center, retrospective, cohort study at a 970-bed Level 1 Trauma Center. The data review period was June 2, 2021 to November 1, 2022. A total of 577 patients were screened for inclusion, with 56 patients enrolled in the study. The study group of interest was patients with vasopressin discontinued at a norepinephrine dose ≤0.1 mcg/kg/min, compared to vasopressin discontinued at a norepinephrine dose >0.1 mcg/kg/min. The primary outcome was the total duration of vasopressors between groups. Key secondary outcomes included clinically significant hypotension, mortality, and length of stay. Data was analyzed by Chi-Square, Fisher's Exact, Student T-Test, and Mann-Whitney-U statistics as appropriate.

Results:
There were no statistically significant differences between groups in baseline characteristics. There was a statistically significant difference in norepinephrine dose at vasopressin discontinuation (0.06 mcg/kg/min vs. 0.21 mcg/kg/min, $p<0.001$). The primary outcome showed no difference in the total duration of vasopressors (86.4 hours vs. 95 hours; $p=0.854$). No differences were demonstrated for clinically significant hypotension ($p=0.491$), mortality (ICU, $p=0.397$; hospital, $p=1$), or length of stay (ICU, $p=0.24$; hospital, $p=0.383$).

Conclusions:
This is the first study to date evaluating a specific norepinephrine dose to guide vasopressin discontinuation during septic shock resolution. These results are hypothesis generating but inconclusive given the small sample size and inability to meet power for the primary outcome. Larger studies should examine the efficacy of specific vasopressor doses to guide discontinuation during septic shock resolution.

Clinical response at 72 hours as a marker for recurrent *Pseudomonas aeruginosa* ventilator-associated pneumonia

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UAN: 0048-0000-23-072-L01-P

Learning Objectives:

1. Discuss the risks and benefits of shorter vs. longer durations of therapy for *Pseudomonas aeruginosa* ventilator-associated pneumonia
2. Describe the role of clinical response in the management of ventilator-associated pneumonia

Purpose:
The optimal treatment duration for *Pseudomonas aeruginosa* ventilator-associated pneumonia (PA-VAP) remains unclear. Longer courses of antibiotic therapy for PA-VAP (e.g. 15 vs 8 days) have been shown to decrease the risk of recurrent pulmonary infection but may not improve mortality. Clinicians often use clinical response to guide treatment durations for PA-VAP, but data to support this approach are lacking. The purpose of this study was to determine whether early response to therapy is correlated with the risk of recurrence in patients with PA-VAP.

Methods:
This is a retrospective cohort study of patients admitted to the Detroit Medical Center from January 2020 to July 2022. Patients ≥ 18 years old with clinical, microbiological, and radiographic evidence of PA-VAP were included in the analysis. Those with improvements in two out of three objective measures of clinical response (PaO2/FiO2, fever, and leukocyte count) at 72 hours were classified as early responders. The primary outcome was PA-VAP recurrence within 28 days of initial VAP onset. Secondary outcomes included all-cause mortality, isolation of P. aeruginosa in a respiratory culture resistant to the index antibiotic, and incidence of *Clostridioides difficile* infection within 90 days. Key exclusion criteria included nonsusceptibility to the initial antibiotic regimen, severe β-lactam allergy, complicated pneumonia, and transfer to hospice.

Results:
A total of 48 patients were included in the analysis: early response, n = 28; delayed response, n = 20. Baseline characteristics between groups were similar except for higher median Charlson Comorbidity Index scores (4 vs 2, P = 0.02), rates of mechanical ventilation due to cardiovascular failure (21% vs 0%, P = 0.03) and a longer median duration of mechanical ventilation prior to VAP onset (19 d vs 9 d, P = 0.006) in the early response group. There were no statistically significant differences in PA-VAP recurrence at 28 days (29% vs 40%, P = 0.41), mortality at 90 days (25% vs 35%, P = 0.45), incidence of a resistant *P. aeruginosa* respiratory isolate (32% vs 45%, P = 0.36), or *C. difficile* infection within 90 days (0% vs 10%, P = 0.09) observed between patients with an early vs delayed response to therapy.

Conclusions:
This study did not show a significant difference in clinical outcomes between patients with and without an early clinical response to therapy for PA-VAP. Further studies are needed to better characterize determinants of PA-VAP recurrence.

"To Treat or Not to Treat?": The Impact of a Pediatric Antimicrobial Stewardship Program on Antibiotic Use in Neonatal Culture Negative Early Onset Sepsis

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UAN: 0048-0000-23-073-L01-P

Learning Objectives:

1. Identify the risk-factors related to increased durations of antibiotic therapy in neonatal culture negative early onset sepsis.
2. Discuss the impact of a pediatric antimicrobial stewardship program on antibiotic use in neonatal culture negative early onset sepsis.

Purpose:
The antibiotic duration for culture negative early onset neonatal sepsis (CN-EOS) remains unclear. The purpose of this study was to evaluate the impact of a pediatric antimicrobial stewardship (PAMS) program on antibiotic treatment of CN-EOS in an acute neonatal population.

Methods:
The PAMS program began in 2020 in the neonatal intensive care unit (NICU) at MetroHealth Medical Center. A retrospective chart review was performed on patients receiving antibiotics for CN-EOS who were admitted during the first 6 months of 2018 prior to the initiation of the PAMS programs (n=89), and in 2022 after initiation of the PAMS program (n=42). The primary objectives were to compare the percentage of patients with negative cultures in the first 48 hours of life who were treated for CN-EOS, as well as to compare the average duration of antibiotic therapy prior to versus after the implementation of a PAMS program. Secondary endpoints included a comparison of maternal and neonatal baseline and laboratory characteristics.

Results:
A total of 512 infants were admitted to the NICU in the 2018 and 2022 cohorts (n=264; n=248, respectively). Of those infants, 130 infants were treated for CN-EOS (n=90 in the 2018 pre-PAMS group, n=40 in the 2022 post-PAMS group). Baseline and demographic characteristics were similar between groups. Of the patients who were initiated on antibiotics at birth, 90 out of 181 (49.7%) and 40 out of 170 (23.5%) continued antibiotics for treatment of CN-EOS, respectively [ARR=26.2%; RRR=52.7%]. There was also a shorter duration of antibiotic therapy in the post-PAMS group, but it did not reach statistical significance (7.97 ± 2.7 days versus 7.15 ± 1.91 days, [p=0.08]).

Conclusions:
A pediatric antimicrobial stewardship (PAMS) program led to a safe and significant reduction in antibiotic usage in our Level III NICU.

Impact of a pharmacist-led population health initiative to improve statin prescribing

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UAN: 0048-0000-23-074-L01-P

Learning Objectives:

1. Discuss the importance of statin medications and the criteria for therapy
2. Review rationale for research study based on current literature
3. Describe a population health-based initiative led by pharmacists to improve statin prescribing

Purpose:
The primary objective of this study is to determine the proportion of patients who meet merit-based incentive payments (MIPS) criteria for statin therapy for the prevention and treatment of cardiovascular disease based on automated electronic health record (EHR) coding that are also indicated to receive statin therapy following a clinical risk/benefit analysis by a pharmacist and primary care physician (PCP). The secondary objectives are to (1) identify the total number of patients started on statin therapy as result of a pharmacist-led, proactive population health-based intervention, (2) compare the proportion of patients appropriately identified as meeting MIPS criteria for statin therapy based on statin benefit group, and (3) compare the likelihood of starting statin therapy based on statin benefit group.

Methods:
This is a retrospective review of data obtained from a pharmacist-led, proactive population-health based intervention focused on reviewing patients listed on an EHR-generated registry as meeting the MIPS criteria for statin therapy. During the intervention, a pharmacist and the patient's PCP independently reviewed each patient chart to determine if the patient had a true indication for statin therapy and/or any contraindication(s) to statin therapy. If statin therapy was indicated, a pharmacist or PCP discussed statin therapy with the patient at which time the patient could accept or decline statin therapy. The EHR and annotated EHR-registry list were reviewed, and objectives were evaluated using descriptive statistics.

Results:
Of the 184 participants, 52 patients (28%) were truly indicated to receive statin therapy following a clinical risk/benefit analysis by a pharmacist and PCP. The total number of patients started on statin therapy as result of a pharmacist-led, proactive population health-based intervention was 8 out of 40 patients contacted (20%). The rate of appropriate patient identification and likelihood of starting a statin therapy was greatest in patients with diabetes, followed by atherosclerotic cardiovascular disease (ASCVD) greater than 20%, low density lipoprotein (LDL) greater than 190 mg/dL, clinical ASCVD, and hypercholesterolemia, respectively.

Conclusions:
Identification of patients indicated for statin therapy based on claims data may be inaccurate and a pharmacist-led intervention using an EHR-generated registry of all patients meeting the MIPS criteria for statin therapy based on EHR coding can positively impact the rate of statin prescribing in the primary care setting.

Comparison of Time to Oral Anticoagulant Reversal in Intracranial Hemorrhage with and without Emergency Medicine Pharmacist Presence

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Learning Objectives:

1. Describe the effect oral anticoagulants have on clinical outcomes in intracranial hemorrhages
2. Evaluate the impact of emergency medicine pharmacists on reversal of anticoagulation and clinical outcomes

Purpose:
Patients who present to the emergency department (ED) with intracranial hemorrhage (ICH) have high mortality rates, with a major risk factor being use of oral anticoagulants (OAC). The purpose of this study is to determine the impact EM pharmacist presence has on time to OAC reversal in patients presenting with an ICH.

Methods:
This was a retrospective, single-center cohort study evaluating time to reversal of OAC-associated ICH at a level one trauma center between November 2016 and September 2022. Patients 18 years or older with an OAC-associated ICH who received at least one dose of an emergent reversal agent in the ED were included. The primary outcome was time to reversal with or without an EM pharmacist present. Key secondary outcomes included hematoma expansion, hospital length of stay (LOS), intensive care unit LOS, and in-hospital mortality. Additional secondary outcomes included disposition on discharge, co-administration of vitamin K, fresh frozen plasma, or packed red blood cells, and appropriateness of reversal agent dosing.

Results:
Of the 157 patients evaluated, 83 patients were included. The most common type of ICH was intracerebral hemorrhage (34.9%) and majority of patients were on warfarin (55.4%). The median time to emergent reversal agent administration was significantly shorter in the EM pharmacist group (49.5 min [31-65] vs. 85 min [50.5-121], p=0.0004). More patients in the EM pharmacist group were discharged home with health care (14.3% vs. 2.4%, p=0.05), whereas more patients in the control group were discharged to intermediate care facilities (40.5% vs. 61%, p=0.06). No differences were noted in additional secondary outcomes.

Conclusions:
The presence of an EM pharmacist for patients presenting to the ED with an OAC-associated ICH decreased time to emergent reversal agent administration by a median of 35.5 minutes. Faster time to reversal was not associated with improved clinical outcomes.

Benefits of a pharmacist-led sickle cell disease management clinic

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Learning Objectives:

1. Review the pathophysiology and related complications of sickle cell disease
2. Describe the operational structure of a pharmacist-led sickle cell disease clinic
3. Analyze the clinical outcomes of a pharmacist-led sickle cell disease clinic

Purpose:

Sickle cell disease (SCD) is a genetic blood disorder resulting in significant clinical complications including acute and chronic pain, acute chest syndrome, and chronic organ damage. Due to these challenges, patients with SCD have high rates of healthcare resource utilization, lifetime medical costs, and mortality. The National Heart, Lung, and Blood Institute Evidence Based Management of SCD guidelines recommend hydroxyurea (HU), an oral antimetabolite, as the primary treatment strategy to reduce the frequency of vaso-occlusive crisis, hospitalization costs, and mortality rates. However, HU has a narrow therapeutic index, requiring frequent laboratory monitoring to achieve a maximal tolerated dose (MTD) while balancing the adverse effects of myelosuppression. A limited number of studies have shown that pharmacist involvement in outpatient SCD management programs improved HU dose optimization and monitoring. The purpose of this study is to describe the outcomes of sickle cell management over 12 months with traditional versus pharmacy-led care.

Methods:

This study is a retrospective, single center, chart review of patients with SCD on HU therapy seen at The Ohio State JamesCare East Hematology/Oncology Outpatient Center between March 2018 and October 2021. The control group includes patients exclusively followed by a physician or certified nurse practitioner compared to patients of the pharmacist-led SCD management clinic. The primary outcome is to compare number of acute care encounters, including emergency department visits and hospital admissions, over 12 months between each cohort. Secondary outcomes include quantifying dose changes and comparing proportion of patients achieving maximum tolerated doses (MTD) between cohorts, and a subgroup analysis of pharmacist-led encounters to quantify and characterize pharmacist interventions and patient satisfaction scores. Data collected includes quantifying emergency room visits and hospital admissions, SCD visits, HU dose adjustments, patients achieving MTD of HU, and mean HU dose. Additional data collected in the pharmacist-led group is the number of pharmacy encounters, visit type, and number and type of non-HU interventions. Pharmacist-led encounter patient satisfaction scores are included.

Results:

Final results to be presented.

Conclusions:

Final conclusions to be presented.

Comparison of Medication Reconciliation Completed Virtually vs. Onsite: A Multisite Pilot Study

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Learning Objectives:

1. Discuss the importance of optimizing medication reconciliation
2. Describe OhioHealth medication reconciliation technician staffing structure
3. Summarize current medication reconciliation research at OhioHealth

Purpose:

Medication reconciliation remains the way many organizations adhere to The Joint Commission's National Patient Safety goal to maintain and communicate accurate patient medication information. In addition to traditional methods of medication reconciliation completed by providers, pharmacists, and pharmacy interns, it is now more commonly facilitated by pharmacy technicians. However, there is a critical need to improve recruitment and retention of pharmacy technicians evidenced by national technician shortages, high turnover, and reported burnout. To date, there is no literature that compares the number of medication reconciliations that are able to be completed onsite versus virtually. Additionally, literature is also lacking in comparing the acuity of medication reconciliations completed. The purpose of this study is to determine if the number of medication reconciliations differ based on whether they are completed on-site or virtually and consider the differences in acuity of the completed medication reconciliations.

Methods:

This is a single center, multi-site, retrospective observational study. Patients evaluated in the Emergency Department with plans for admission during the month of October 2022 were included. The primary aim of this study is to compare the percent capture rates of medication reconciliation between two hybrid sites to an all in-person site within a health-system. Our secondary objective will be to compare the differences in the 'medication reconciliation acuity score' which is defined as the total number of edits, additions, and deletions.

Results:

A total of 2454 medication reconciliations were completed in-person and 873 medication reconciliations were completed in the hybrid environment during the month of October 2022. The medication reconciliation capture rate at the in-person site was 74.16%. The hybrid sites' medication reconciliation capture rates were 80.97% and 91.54%. There was a statistically significant difference in time spent on medication reconciliations between in-person and hybrid [15min (IQR 10-15) vs 15min (10-20); $p \leq 0.001$]. No difference in total medications on each medication reconciliation between in-person and hybrid [11 (5-16) vs 11 (6-16); p=0.252]. No difference in changes made on medication reconciliations between in-person and hybrid [4 (1-7) vs 3 (1-7); p=0.595].

Conclusions:

Medication reconciliation performed in-person and in a hybrid environment is comparable based on the time spent completed on medication reconciliation, the total medications, and the number of changes made on the medication reconciliation.

Code Blue? Pharmacy can help, too! Evaluating ACLS medication compliance with clinical pharmacy specialist support

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Learning Objectives:

1. Review the ACLS guidelines for code blue response.
2. Discuss the implementation of a clinical pharmacy specialist to the code blue response team at UH Parma Medical Center and its impact on code blue response medication compliance.

Purpose:
It has been previously established that pharmacists play a significant role during cardiopulmonary arrest and stand to add benefit by increasing Advanced Cardiopulmonary Life Support (ACLS) algorithm compliance through advocating for appropriate medication based on EKG rhythm, ensuring correct medication dosage, and facilitating timely medication administration. At University Hospitals Parma Medical Center (UH PMC), pharmacists have not historically participated in code blue response. With UH PMC's addition of clinical pharmacy specialists to the code blue team, we aim to evaluate changes in ACLS medication compliance during in-hospital cardiopulmonary arrest.

Methods:
Data was collected through patient chart review. This is a single-center, pre-post cohort study from August 2021 through January 2022 and August 2022 through January 2023. Clinical pharmacy specialist presence during code blue response was analyzed as the predictor variable. The primary objective is to determine if clinical pharmacy specialist participation in code blue response increases overall ACLS medication compliance. The secondary objectives are to determine if clinical pharmacy specialist participation in code blue response decreases the number of deviations from ACLS algorithms with a focus on correct medication for EKG rhythm, correct medication dosage, and correct medication administration time. Data was collected for four primary ACLS medications: amiodarone, atropine, epinephrine, and lidocaine. Chi square analysis and descriptive statistics were used to analyze the data.

Results:
For the primary endpoint of overall ACLS compliance, the non-pharmacist pre-cohort saw 369/397 compliant actions (92.9%). In the pharmacist post-cohort, there were 167/181 actions (92.3%) (chi-square value = 0.086, p = 0.77). For the secondary endpoints of ACLS compliance with the correct medication for EKG rhythm, correct medication dosage, and correct medication administration time, the chi-square values were = 0.296 (p = 0.59), 0.005 (p = 0.94), and 0.289 (p = 0.59), respectively.

Conclusions:
There was no statistically significant difference between the cohorts for the primary or secondary endpoints. Although there was no statistically significant difference, overall compliance in both cohorts was higher as compared to corresponding cohorts of previously published studies.

Impact of Pharmacist-Driven Education on Vaccine Rates in Populations Living with Chronic Inflammatory Diseases

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Learning Objectives:

1. Describe the impact of chronic inflammatory disease on the immune system and how this relates to suboptimal health outcomes in vaccine-preventable disease.
2. Discuss the significance of pharmacist-driven counseling in COVID-19, Influenza, and Pneumococcal Pneumonia vaccine uptake in patients living with chronic inflammatory disease.

Purpose:

Chronic inflammatory disease (CID) refers to conditions where normal inflammation becomes prolonged. Altered immunocompetence of individuals with CID leads to potential increased risk of preventable diseases. The Centers for Disease Control recommend influenza, pneumococcal, and COVID19 vaccination to reduce the incidence of hospitalization and death in this population. Pharmacists are well positioned to increase vaccination rates by acting as educators and immunizers. This study aims to analyze the impact of pharmacist-driven education on influenza, pneumococcal, and COVID-19 vaccination rates in patients living with CID. Secondary outcomes include type of vaccine given, location, number, and length of time for each intervention.

Methods:

This is a prospective, cohort study. Eligible subjects will include adults 18 years old or older living with CID who have their medications managed by a specialty pharmacy. During specialty medication refill scheduling calls, eligible patients will be asked standardized questions by a pharmacist to determine if they are up to date with COVID-19, influenza, and pneumococcal vaccinations. Once verbal consent for study participation is obtained, patients who are not up to date will be flagged within an outreach platform and sent appropriate vaccine information sheet(s) and consent documentation with their medication. During Week 2, patients will be contacted via telephone call by the principal investigator (PI) and provided tailored vaccine education. If subjects are unable to be contacted, a second attempt will be made within 7 days. Prior to medication refill calls in Week 8, the PI will assess vaccine status by searching the study site's patient management system and Ohio's State Immunization Portal. During this refill call, the patient will be asked for the information related to the primary and secondary objectives. The primary outcome will be analyzed by logistic regression. Descriptive statistics and the Wilcoxon Rank Sum Test will be used to analyze the secondary outcomes of this study.

Results:

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

Conclusions:

Conclusions will be presented at the Ohio Pharmacy Residency Conference

Comparison of Insulin Glargine Versus Insulin NPH for Glycemic Control in the Medical Intensive Care Unit (MICU)

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Learning Objectives:

1. Describe the pharmacokinetic differences between insulin glargine and insulin NPH.
2. Review current literature findings for the preferred basal insulin choice in critically ill patients.

Purpose:
Insulin glargine and insulin neutral protamine hagedorn (NPH) have differing pharmacokinetic profiles. Studies thus far have reported conflicting data, so determining which basal insulin is preferred in ICU patients is yet to be confirmed. The purpose of this study is to determine if there is a preferred basal insulin for critically ill patients.

Methods:
This is a retrospective, multicenter chart review study. Adult patients who were administered insulin glargine or insulin NPH while admitted to the Medical Intensive Care Unit (MICU) were included in this study. Retrospective chart reviews were completed for those patients admitted between June 14th, 2020 and June 13th, 2021. Exclusion criteria includes age less than 18 years, pregnancy, incarcerated patients, and patients with an active diagnosis of diabetic ketoacidosis or hyperosmolar hyperglycemic state. The primary outcomes include the time to a blood glucose goal of <180 mg/dL after MICU admission and the total duration of time within a blood glucose range of 100-180 mg/dL. Secondary outcomes include length of stay in the medical intensive care unit and in the hospital. Safety outcomes focus on the occurrence of hypoglycemic events.

Results:
A total of 66 patients were included in this study. Thirty-three patients received insulin glargine and thirty-three patients received insulin NPH. The mean difference in time to reach a blood glucose reading of < 180 mg/dL was 5.9 hours (95% CI: -22 to 11 hours), favoring a shorter duration of time in patients receiving insulin NPH: 34.6$\pm$26.9 hours vs. 40.5$\pm$37.6 hours (t=-0.719, p=0.479). Similar rates of hypoglycemic events occurred between each group (p=0.593).

Conclusions:
Although not a statistically significant difference, patient's receiving insulin NPH reached a blood glucose of less than 180 mg/dL quicker and were within goal range for more time, without hypoglycemic episodes. Further studies with a larger sample size and similar baseline characteristics are needed.

Continuous Thiazide Infusion Versus Intermittent Dosing for Sequential Nephron Blockade in Acute Decompensated Heart Failure

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Learning Objectives:

1. Review currently available literature supporting the use of adjunctive thiazide or thiazide-like diuretics in the setting of loop diuretic resistance in acute decompensated heart failure.
2. Identify pharmacokinetic differences between the thiazide and thiazide-like diuretics chlorothiazide and metolazone.

Purpose:
Thiazide diuretics are often used to augment diuresis in patients presenting with volume overload in acute decompensated heart failure (ADHF) that inadequately respond to loop diuretics alone. Intermittent doses of intravenous (IV) chlorothiazide or oral (PO) metolazone are typically the agents of choice, however a continuous combination furosemide-chlorothiazide infusion has been described with very little evidence for its use. This study aimed to compare the effect of a continuous, intermittent IV, or intermittent PO thiazide, in conjunction with a loop diuretic, on urine output (UOP) in the management of AHDF.

Methods:
This institutional review board-approved retrospective cohort study evaluated patients admitted with ADHF undergoing diuresis with an IV loop diuretic in conjunction with at least one dose of an intermittent IV or PO thiazide or at least six hours of a continuous combination loop-thiazide infusion. The primary outcome was UOP at 24 hours after the initial qualifying thiazide dose. Secondary outcomes included UOP at 48 hours, change in weight, hospital length of stay, rate of acute kidney injury, 30-day readmission rates, new electrolyte imbalances, and average daily UOP during thiazide treatment. Continuous outcomes were analyzed using an analysis of variance (ANOVA) with a Tukey post-hoc test. Nominal data was analyzed using a Chi-squared or Fisher's exact test, as appropriate

Results:
A total of 256 patients were screened, of which 150 were included in the primary outcome analysis. Results from the primary outcome found a mean 24-hour UOP of 2205 (± 2920) mL with intermittent IV chlorothiazide, 3520 (± 3422) mL with intermittent PO metolazone, and 3511 (± 3361) mL with continuous combination furosemide-chlorothiazide ($P = 0.07$).

Conclusions:
In conjunction with loop diuretics, intermittent metolazone and continuous chlorothiazide produced a numerical, though nonsignificant, increase in urine output at 24 hours compared to intermittent chlorothiazide.

Design and Implementation of Pharmacist Billing through Chronic Care Management Services at a Family Medicine Office

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Learning Objectives:

1. Define the Centers for Medicare & Medicaid Services (CMS) eligibility requirements for patient enrollment in the chronic care management (CCM) program
2. Describe the potential benefits of the provision of CCM services by a pharmacist
3. Discuss barriers to the implementation of a CCM program in the primary care setting

Purpose:

The purpose of this design project is to implement a billable CCM program within the office of Mercy Health Waterville Primary Care. The physician from this office has identified that collaboration with pharmacists through the provision of CCM services would be valuable to qualifying Medicare beneficiaries that have established care within the office. Pharmacists can assist these patients and collaboratively work with this physician to decrease health related complications, improve clinical outcomes, and prevent hospital admissions through the provision of patient education as well as the adjustment of individualized pharmacologic and non-pharmacologic treatment plans as indicated. However, no formal workflow has been developed to identify, enroll, and follow-up with patients from this office that are eligible to enroll in CCM services per CMS requirements. In addition, no standard protocols have been established by this office regarding CMS documentation and billing requirements for a CCM program.

Methods:

This team of pharmacists will collaborate with a physician, office staff, and system level leadership on this project to design and implement a standardized CCM program that could potentially serve as a source of billable revenue for pharmacists. The improvement science of Plan, Do, Study, Act (PDSA) will be utilized to identify process owners, design standard protocols, define and test the necessary components of a CCM program workflow, develop data collection tools, and monitor for continuous improvement of these processes. This will include at a minimum: identification of eligible patients, verification of patient eligibility for the CCM program, education of patients and providers, the referral and scheduling of patients, and documentation to satisfy CMS billing and compliance requirements.

Results:

PDSA testing and data collection is ongoing with preliminary results to be presented at the 2023 Ohio Pharmacy Resident Conference.

Conclusions:

Preliminary conclusions will be presented at the 2023 Ohio Pharmacy Resident Conference.

Venous Thromboembolism Prophylaxis Strategies in Underweight Critically Ill Patients

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Learning Objectives:

1. Define current recommendations for venous thromboembolism (VTE) prophylaxis in hospitalized patients
2. Describe VTE prophylaxis therapy in underweight, critically-ill patients

Purpose:
The CHEST guidelines recommend VTE prophylaxis in critically-ill patients, however, recommendations specific to underweight patients are lacking. The goal of this study is to compare the safety and effectiveness of various VTE prophylaxis regimens in underweight, critically ill patients.

Methods:
This multi-center, cohort study included critically-ill patients with a documented weight less than 50 kg who received VTE prophylaxis for a minimum of 48 hours. Patients were either placed into a standard-dose group (enoxaparin 40 mg daily, enoxaparin 30 mg twice daily, or heparin 5,000 units every 8 hours) or a reduced-dose group (enoxaparin 30 mg daily or heparin 5,000 units every 12 hours). The primary endpoint was the composite of major bleeding and clinically-relevant non-major bleeding. Secondary endpoints included the incidence of major bleeding, clinically-relevant non-major bleeding, and VTE.

Results:
419 patients were included in this study. Underweight patients who received reduced dose prophylaxis experienced a lower incidence of composite bleeding (12.5% vs 5.0%, p=0.02). When controlling for confounders, there was still a significant reduction of bleeding (OR 0.40, CI 0.16-0.98). For major bleeding, there was a trend towards reduction of bleeding in the reduced dosed group when compared to the standard dose group (8.6% vs 3.6%, p=0.056). No significant differences were noted between standard and reduced dose prophylaxis groups for the outcomes of CRNMB (5.4% vs 2.9%, p=0.24) or VTE ((2.2% vs 0%, p=0.08). A subgroup analysis revealed no difference in the composite bleeding outcome based upon agent (p=0.13).

Conclusions:
Reduced dosed VTE prophylaxis offers a significant reduction in composite bleeding when compared to a standard dose group. Reduced dose VTE prophylaxis should be considered in underweight, critically-ill patients.

Medication Safety in Neonates: Optimization of CPOE

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Learning Objectives:

1. Identify factors that contribute to an increased potential for error when dosing medications in neonates.
2. Describe future directions to decrease the potential for error when ordering medications in neonates.
3. Discuss the methods and results of current study

Purpose:

In neonates, altered pharmacokinetic values and small body size result in a narrow margin of error leading to an increased potential for medication dosing errors. Neonatal medication safety can be enhanced through the use of computerized physician order entry (CPOE). In February 2020, CPOE newborn medication orderables (NBS) were implemented at Ascension St. John Hospital in response to a trend of increased dosing related errors being reported in the Event Reporting System (ERS) system. The aim of this study is to assess the potential for medication ordering errors pre- and post- CPOE NBS implementation.

Methods:

This was a historical cohort study conducted using NICU medication orders from September 2018 to November 2019 (pre-CPOE NBS) and May 2020 to July 2021 (post-CPOE NBS) at Ascension St. John Hospital. Individual medication order sentences for eight high-frequency, high-risk medications were collected. Yes/No data points for each order collected included: 1) weight-based, 2) modified by pharmacist, 3) measurable volume. A score of 1 point was assigned for each "Yes" response and 2 points for each "No" response (except for data point #2 in which inverse scoring was used) and assigned an overall potential for error score (Range 3-6 points). Other Yes/No data points assessed but not factored into the overall potential for error score included: 1) ordered via PowerPlan/NBS, 2) role of ordering provider. Categorical variables were assessed using Chi-square and continuous variables using student's t-test.

Results:

There was a statistically significant decrease in the overall potential for error score pre- and post-NBS implementation (pre-NBS 3.88; post-NBS 3.48, $p<0.05$).

Conclusions:

NBS orderables significantly reduced the potential for medication ordering errors.

Evaluation of DOAC Use Among Fragile Patients in VTE and AF

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Learning Objectives:

1. Describe how fragile patients have been defined in direct oral anticoagulant (DOAC) literature
2. Discuss how safety and efficacy of DOACs in venous thromboembolism (VTE) and atrial fibrillation (AF) among fragile patients have been evaluated

Purpose:

The objective of this study is to assess risk of bleeding and thrombotic events among fragile patients treated with direct oral anticoagulants (DOACs) for atrial fibrillation (AF) or venous thromboembolism (VTE). Outcomes will be based on real-world data in a fragile population that includes a significant proportion of Black Americans, an under-represented group in clinical trials.

Methods:

This was a retrospective chart review of patients prescribed a DOAC for VTE or AF from January 1, 2017 through December 31, 2022. Inclusion criteria included patients ≥18 years of age with established care in one of two outpatient clinics within the Detroit Medical Center. Patients who received concomitant dual antiplatelet therapy or had a cancer diagnosis within two years were excluded. A fragile patient was defined as age >75 years in addition to one of two criteria: creatinine clearance <50 mL/min or total body weight ≤60 kg. The primary outcome was a composite of major bleeding, clinically relevant non-major bleeding, minor bleeding, and thromboembolism. A Cox proportional hazards model was used to assess the risk of an adverse event by fragile status, adjusting for patient characteristics. Secondary outcomes included anticoagulation-related bleeding, thrombotic events, and characterization of DOAC use. DOAC use was characterized by indication, agent selection, on-label or off-label dosing, concomitant antiplatelet monotherapy, and CHA_2DS_2-VASc score. Data collection also included age, race/ethnicity, sex, height, weight, and comorbidities.

Results:

Results will be presented at the Ohio Pharmacy Residency Conference.

Conclusions:

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

Implementation of Team-Based Care and Remote Blood Pressure Monitoring Service in a Primary Care Clinic

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Learning Objectives:

1. Define remote patient monitoring (RPM)
2. Describe the development of a team-based workflow utilizing RPM of blood pressure
3. Interpret potential barriers that may arise when implementing RPM services

Purpose:
This project aims to describe the process of implementing remote blood pressure monitoring using a team-based approach to help improve blood pressure control within an outpatient primary care clinic. The co-primary objectives of the study are to (1) describe the development of a team-based care workflow utilizing remote patient monitoring of blood pressure; and (2) describe the barriers that arose post-workflow implementation.

Methods:
Pharmacists at the primary care clinic manage hypertension under a collaborative practice agreement (CPA), and when applicable employee remote patient monitoring (RPM) of blood pressure using home devices that are loaned to the patient. This project will describe the implementation of a new workflow between October 2022 and January 2023 that was designed to increase access and utilization of remote blood pressure monitoring devices. Descriptive statistics will be used to characterize the workflow.

Results:
After workflow implementation and provider and staff education, there were 34 new referrals to pharmacy for hypertension management. Of these, 94% of patients were scheduled as an in-office visit for the initial encounter, and 88% of the scheduled patients brought their home cuff in for calibration. A total of 7 clinic-owned remote blood pressure devices were loaned to patients for RPM during the project timeline.

Conclusions:
There were several barriers identified throughout this project including logistics required to set up RPM with a blood pressure device, as well as patient willingness to come in office for a visit during a time when telehealth services have expanded. Overall, this project highlighted the utility of a team-based approach and in-office visits to prevent the delay of accurate home blood pressure management.

Continuation of Inpatient-Ordered Loop Diuretics: A Review of Diuretic-Naïve Patients without Heart Failure or Liver Disease

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Learning Objectives:

1. Discuss relevant gaps in literature regarding iatrogenic fluid overload and "de-resuscitation"
2. Review the aim and methods of the COLD-Pause Study
3. Analyze results of the COLD-Pause study and apply findings to relevant literature

Purpose:

Latrogenic fluid overload (FO) in hospitalized patients is a potential complication resulting from overzealous intravenous (IV) fluid administration or large volume resuscitation. The risk of FO and sequalae of prolonged net-positive fluid status have been well documented in the literature, specifically for critically ill patients who require large amounts of IV fluid to maintain hemodynamics. In recent literature, de-resuscitation of diuretic-naïve, fluid overloaded inpatients with loop diuretics to achieve a net negative fluid status has become a more common practice. Previous studies have largely focused on patients with common indications for loop diuretics at discharge (e.g. congestive heart failure, ascites, etc.), but do not assess continuation of loop diuretics in patients without an evidence-based or guideline-directed indication. This study aims to assess the 30-day, all-cause readmission rate of patients who were diuretic-naïve prior to admission and discharged on a loop diuretic without a diagnosis of heart failure or liver disease. We hypothesize that patients continued on a loop diuretic in the absence of heart failure or liver disease are at a higher risk of readmission compared to those who were not discharged on a diuretic.

Methods:

This was a retrospective, single-center, chart review approved by the Investigational Review Board (IRB). Eligible patients were adults admitted between August 2019 to July 2022 who received at least 1 dose of a loop diuretic and had a medication reconciliation completed by pharmacy services. Patients with a past medical history or new diagnosis of heart failure or liver disease were excluded. The primary outcome was rate of readmission between patients who were discharged on a loop diuretic compared to those who were not. Secondary endpoints included length of stay, loop diuretic indication, and rate of diuretic administration based on location within the hospital. Categorical data was assessed using a chi-square or Fischer's exact test and continuous data was assessed using the student's t-test or MannWhitney U-test as appropriate.

Results:

Final results are pending and will be presented at the Ohio Pharmacy Resident Conference.

Conclusions:

Conclusions of this study will be presented at the Ohio Pharmacy Resident Conference

Comparison of heart rates in patients initiated on ticagrelor versus other oral P2Y12 inhibitors for inferior ST-elevation myocardial infarctions (STEMI)

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UAN: 0048-0000-23-088-L01-P

Learning Objectives:

1. Review current evidence supporting use of P2Y12 inhibitors for inferior ST segment myocardial infarction
2. Discuss the incidence of bradycardia as a clinically relevant side effect in P2Y12 inhibitor use

Purpose:
Half of patients suffering an inferior ST elevation myocardial infarction (STEMI) have complications associated with increased mortality, including development of bradycardia and atrioventricular (AV) block. Current guidelines recommend aspirin and an oral P2Y12 inhibitor as dual antiplatelet therapy (DAPT) to prevent stent thrombosis in those who undergo percutaneous coronary intervention (PCI) with stent placement. Ticagrelor has been shown to increase adenosine plasma concentrations leading to adverse effects including bradyarrhythmias. Clopidogrel and prasugrel have not shown any association with bradyarrhythmias. The purpose of this study was to determine the incidence of bradycardia after ticagrelor initiation compared to clopidogrel or prasugrel in inferior STEMI patients.

Methods:
This was a retrospective, multicenter study conducted at three primary PCI centers between January 1, 2017 and September 30, 2022. Adult patients were included if they were diagnosed with an inferior STEMI to the right coronary artery and treated with PCI followed by an oral P2Y12 inhibitor. The primary outcome was heart rate (HR) at 48 hours or discharge after administration of ticagrelor compared to clopidogrel or prasugrel. Secondary outcomes included incidence of bradycardic events, timing to initiation of beta-blocker, and beta-blocker therapy initiation or continuation at discharge.

Results:
This study enrolled 331 patients, 172 in the ticagrelor group and 159 in the clopidogrel/prasugrel group. There was no statistical difference between groups with regards to the primary outcome, with a median HR of 76 bpm [67-85] in the ticagrelor group vs 73 bpm [66-84] in the clopidogrel/prasugrel group (p=0.238). No differences were observed between groups regarding any secondary outcomes.

Conclusions:
No difference was demonstrated between ticagrelor and clopidogrel or prasugrel in heart rate, bradycardic events, or ability to tolerate beta-blocker therapy after initiation of a P2Y12 inhibitor in patients with an inferior STEMI.

Venous Thromboembolism Prophylaxis Usage in Hospitalized Patients with Cirrhosis and Coagulopathy

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UAN: 0048-0000-23-089-L01-P

Learning Objectives:

1. Explain existing literature on the incidence of venous thromboembolism (VTE) and the usage of VTE prophylactic agents in hospitalized patients with cirrhosis
2. Discuss the use of VTE prophylactic agents in patients with cirrhosis and its relationship with coagulopathy

Purpose:

Hospitalized patients with cirrhosis are at high risk for VTE despite elevated international normalized ratio (INR) levels. VTE prophylactic agents are recommended by the American College of Chest Physicians to reduce the risk of VTE for hospitalized patients. However, multiple studies found a significant reduction in prescribing VTE prophylactic agents for hospitalized patients with chronic liver disease; some even mentioned that high INR levels correlated with a lack of VTE prophylaxis. This study aims to investigate if pharmacological VTE prophylaxis is underutilized for patients with cirrhosis with high INR and to analyze the safety and efficacy of using VTE prophylactic agents in this patient population.

Methods:

This retrospective cohort study was conducted at the University of Cincinnati Medical Center and West Chester Hospital. Patients were included in this study if they had a diagnosis code for cirrhosis, were admitted between July 31st, 2020, to July 31st, 2022, were 18 years or older, had an inpatient stay for at least 48 hours, and had an in-hospital INR level at least 1.7. Patients were excluded if they were prisoners, pregnant, had a history of a liver transplant, were on anticoagulation therapy or hormonal replacement therapy prior to admission, had active malignancy or thrombophilia, were admitted for a liver transplant, active VTE or portal vein thrombosis, or had contraindications for VTE prophylaxis. Patients were divided into two groups based on their highest INR level: 1.7-2.1 and >2.1. The primary outcome is the rate of pharmacological VTE prophylaxis usage, and the secondary outcome is the percentage of in-hospital VTE events and bleeding events.

Results:

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

Conclusions:

Final results and conclusions will be presented at the Ohio Pharmacy Residency Conference.

Pharmacist-Led Interventions in Heart Failure Patients to Optimize Guideline Directed Medical Therapy in an Outpatient Medication Management Clinic

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UAN: 0048-0000-23-090-L01-P

Learning Objectives:

1. Summarize current practice guideline recommendations related to chronic heart failure with reduced ejection fraction
2. Compare previous studies evaluating the need for heart failure medication optimization and implementation
3. Describe the process of pharmacist led interventions to optimize guideline directed medical therapy (GDMT) in heart failure patients in the setting of an outpatient medication management clinic affiliated with a small community hospital

Purpose:

Guideline directed medical therapy (GDMT) improves outcomes in Heart Failure (HF) patients with reduced ejection fraction (HFrEF). GDMT for HF includes 4 pillars of medications (ie. renin-angiotensin-aldosterone system inhibitors with or without a neprilysin inhibitor, β-blockers, mineralocorticoid-receptor agonists, and sodium glucose co-transporter 2 inhibitors) with targeted doses for maximum benefit. Many eligible patients are receiving inadequate GDMT with absence of one or more of the recommended medications and/or suboptimal dosing. This study aimed to evaluate the impact of pharmacist-led interventions to ensure that HFrEF patients receive adequate GDMT.

Methods:

This study was conducted in an outpatient medication management clinic affiliated with a small community hospital. Patients were included if they were ≥18 years, had a history of HF with left ventricular ejection fraction (LVEF) ≤40% and inadequate GDMT. Dialysis or pregnant patients were excluded. Eligible patients were referred by cardiologists to the clinic. Initial visit assessed patient history and provided education. Using a cardiologist-approved protocol, the pharmacist aimed to achieve adequate GDMT, including all 4 pillars and targeted doses, if feasible. Medications were titrated every 2 weeks to obtain maximally tolerated or targeted doses. The primary outcomes were the number of patients that achieved adequate GDMT at the end of 90-day post enrollment and the number of pharmacist interventions to achieve optimal GDMT. Secondary outcomes included LVEF compared to baseline, quality of life measured with the Kansas City Cardiomyopathy Questionnaire (KCCQ-12), and the type of intervention made by the pharmacist.

Results:

Research in progress

Conclusions:

Research in progress

Impact of Clinical Pharmacists in the Inflammatory Bowel Disease Clinic

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Learning Objectives:

1. Review the complexity of Crohn's disease and the gaps in between guidelines and clinical practice in the management of Crohn's disease.
2. Describe how an interdisciplinary approach in an Inflammatory Bowel Disease Clinic can impact patients with Crohn's Disease.

Purpose:

Crohn's disease has a wide spectrum of clinical presentations with disease burden measured by a combination of clinical symptoms and quality of life. To induce and maintain remission in patients with Crohn's disease, The American Journal of Gastroenterology guidelines recommend the use of biologics and immunomodulator medications. While guidelines do not specifically recommend an interdisciplinary approach, evidence has shown pharmacists improve adherence and medication acceptance.
The purpose of this study is to describe pharmacist utilization in an academic medical center interdisciplinary IBD clinic and evaluate clinical impact on patient quality of life.

Methods:

This was an IRB-approved retrospective study at the Ohio State University Wexner Medical Center Inflammatory Bowel Disease Center. The primary outcome is to compare the proportion of patients achieving a Harvey-Bradshaw Index (HBI) reduction of at least 3 points at 6 months after Crohn's therapy initiation. Two groups being compared were patients prior to pharmacist involvement in November 2018 to April 2019 to patients after pharmacist involvement in November 2021 to April 2022. Secondary outcomes include comparing the change in disease severity as defined by HBI, total patients on target dose/maximally tolerated dose of azathioprine, change in SIBDQ score, composite of ED visits, hospitalizations, surgical procedures related to Crohn's disease, change in PHQ-9 score, total corticosteroid use, unique patients seen by provider, up to date vaccine status, and cost to payor. Subgroup analysis also performed on patients seen in the pharmacist-run clinic to describe interventions made by the clinical pharmacists.

Results:

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

Conclusions:

Final results and conclusions will be presented at the Ohio Pharmacy Residency Conference

Evaluation of pharmacist led point of care testing in the underserved community setting.

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UAN: 0048-0000-23-092-L04-P

Learning Objectives:

1. List point of care tests that pharmacists may perform in the community setting.
2. Evaluate the utility of point of care testing in underserved populations.
3. Explain the clinical benefits of routine point of care testing.

Purpose:
The purpose of this study was to evaluate the impact pharmacists have in the underserved community setting when partnering with a nurse practitioner (NP) and utilizing point of care testing (POCT). St. Vincent de Paul Charitable Pharmacy (SVDPCP) is a community pharmacy that provides free medications, on-site clinical services, and primary care for underserved patients. Nine POCT are utilized. These include: lipid panel, HbA1C, thyroid stimulating hormone (TSH), urine human chorionic gonadotropin (HGC), PT/INR, comprehensive metabolic panel (CMP), urinalysis, hemoglobin, and strep A. This study assesses which POCT were the most utilized, the clinical impact from performing these tests, and estimated cost avoidance of providing these POCT versus laboratory-based testing.

Methods:
A retrospective review of electronic health record (EPIC) and pharmacy processing system (QS1) data for 94 adult patients who received at least 1 POCT at SVDPCP between 1/1/22 and 12/31/22 was performed. Patients who missed appointments or did not have POCT completed within this time frame were excluded. Patients were initially seen by the NP. The NP would then communicate indicated POCT to a pharmacist. The pharmacist would complete the POCT, discuss the results with the patient share the results with the NP. Descriptive statistics were used to analyze patient demographics, POCT frequency, and percentage of POCT completion. Clinical outcomes were assessed for HbA1C and lipids. A Paired t-test was performed to evaluate the comparison of internal POCT supply cost to Medicare reimbursement data.

Results:
A total of 94 patients were included in this study with 50% male, 41% Hispanic, and an average age of 52. The three most utilized POCT were the lipid panel (N=90), CMP (N=88), and TSH (N=71). Performing these as POCT verses laboratory-based tests resulted in a cost savings of $1,063.21, which equates to a 25% cost reduction. There were statistically significant clinical outcomes for HbA1C, total cholesterol and LDL reduction among those receiving pharmacist provided POCT.

Conclusions:
Pharmacist provided POCT resulted in interventions, medication changes, and specialist referrals that would not have been made otherwise; Ultimately, helping close healthcare gaps for patients. Utilization of POCT led to statistically significant clinical outcomes for HbA1C and cholesterol. There is significant cost savings associated with utilizing POCT. This study demonstrates that POCT could be expanded into other community pharmacies to address health disparities, reduce costs, and laboratory burdens.

Comparing the Effectiveness of Multimodal Analgesia at Reducing Opioid Requirements in Opioid Naïve verses Opioid Tolerant Trauma Patients.

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Learning Objectives:

1. Recognize the effectiveness of multimodal analgesia for treatment of pain in trauma patients that are opioid naïve versus nonopioid naïve by comparing oral morphine equivalents (OMEs).
2. Evaluate the differences in pain scores between opioid naïve versus nonopioid naïve trauma patients by using verbal pain score or critical-care pain observation (CPOT).

Purpose: Patients hospitalized after traumatic injury are often treated with opioids for pain management. Opioids should be used cautiously in patients with a history of substance abuse disorder. Multimodal analgesia is a pain management strategy that combines opioid and nonopioid agents to achieve analgesia with lower opioid requirements and has been validated in generalized trauma patients.

Methods: Adult trauma patients between 11/1/21 and 10/31/22 admitted to ICU with overall length of stay of at least 5 days were included for retrospective chart review. The opioid tolerant group (OTG) was identified based on a history of substance/alcohol abuse disorder, chronic pain with opioid use, and/or positive urine drug screen. The primary outcome was opioid requirements (based on oral morphine equivalents [OME]) on days 1-5. Secondary outcomes included pain score (verbal or CPOT) on days 1 and 5.

Results: 113 patients were included: 54 OTG and 59 opioid naïve (NG). Demographics between the two groups were similar except for notable differences in age (mean age OTG=46.8 years, NG=58.2 years, p=0.003) and mechanism of injury. Mean OME was significantly higher in the first 24hrs in OTG vs NG (155.9 ± 149.3 vs 89.9 ± 117.6; p=0.0008). However, the difference between groups was no longer significant at day 5 (110.5 ± 199 vs 120.5 ± 252.9; p=0.6). Pain scores were similar for OGT and NG at days 1 and 5 (7.5 ± 3 vs 6.6 ± 2.8; p=0.10) and (5.6 ± 2.8 vs 4.1 ± 3.2; p=0.11).

Conclusion: Multimodal analgesia has been previously validated as an effective pain management strategy in trauma patients, decreasing opioid use while maintaining comparable analgesia. This study confirmed that opioid tolerant patients can achieve comparable pain scores with a multimodal strategy while also reducing their opioid needs to a similar level as trauma patients without opioid tolerance.

Impact of a novel flowchart to reduce time to non-formulary medication order resolution

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Learning Objectives:

1. Discuss what a Hospital Formulary is and the challenges revolving around non-formulary medication management
2. Identify strategies to streamline processes for reconciling non-formulary medication requests

Purpose:

A keyword search of hospital formulary management in PubMed resulted in 1597 results with the earliest being a 1948 Bulletin from the American Society of Hospital Pharmacists titled "Therapeutics committee and the hospital formulary". A Search of hospital non-formulary management however only results in eight articles with only one published in the United States in 1989 and none describing best practices for managing non-formulary requests when there are no medication alternatives on formulary. The purpose of this study is to assess the implementation of a novel flowchart to streamline processes for resolving non-formulary medication requests in a timely manner while also reviewing the financial impact to the hospital.

Methods:

A quasi-experimental study with pre-post intervention review with a pre-intervention period of January 1st, 2022 to December 31st, 2022 and post-intervention period starting March 24th, 2023 and ongoing. A review of time from non-formulary drug orders with no hospital formulary equivalent to resolution is being collected for each drug order during the study period. A review of monthly time periods of financial data for non-formulary procurement by the hospital pharmacy is also being conducted. The primary outcome is time to non-formulary medication order resolution defined as medication order verified onto the patient medication profile, medication order cancelled, patient transfer, or patient discharge. Secondary outcomes include financial impact of post-intervention workflow processes. Both continuous variables, time to non-formulary medication order resolution and monthly financial impact will be analyzed using student's t-test.

Results:

Data analysis is ongoing and preliminary results will be presented at the 2023 Ohio Pharmacy Resident Conference.

Conclusions:

To be presented at the 2023 Ohio Pharmacy Resident Conference.

Evaluating the incorporation of a medication misuse and safety training program into a Doctor of Pharmacy curriculum

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UAN: 0048-0000-23-095-L05-P

Learning Objectives:

1. Review the process for incorporating a medication misuse and safety training program into a PharmD curriculum
2. Identify students' perceptions, satisfaction, and intentions following completion of a medication misuse and safety training program
3. Describe curricular and assessment activities that could evolve following the incorporation of a medication misuse and safety training program into a PharmD curriculum

Purpose:

The primary objective of this study is to describe the process of incorporating a validated, well-established medication misuse and safety training program, previously completed by over fifty pharmacy students and adapted for other health professional students, into a Doctor of Pharmacy curriculum. As medication misuse continues to be an important public health issue, it is essential pharmacy graduates develop skills to confidently deliver safe medication taking messages to people of all ages and serve as medication safety advocates throughout their work and community environments. The goals of this project are to describe the process of incorporating the medication misuse and safety training program into required Doctor of Pharmacy courses and to assess students' perceptions of the program and completion of activities that utilize knowledge and skills gained from the training.

Methods:

A medication misuse and safety training program will be implemented into a foundational communication and self-care course during autumn semester 2022. Descriptive data from student survey responses will be analyzed to identify trends in satisfaction, perception, and intention to utilize programming. Post-program student reflections and group discussions will be utilized to help students prepare for incorporation of program activities into introductory community-focused experiential rotations and community practice. Student documentation of activities will be reviewed and analyzed to identify trends. Students will be followed through subsequent didactic courses during the remainder of their first year, and a survey will be administered approximately six months after the training to assess knowledge retention and current or future utilization of the programming. Student data as well as a description of the program implementation process including example survey tools and activities will be presented.

Results:

Research in progress.

Conclusions:

This project will help describe student engagement with a medication misuse and safety training program. The results of this project will help inform the feasibility of larger scale implementation of this training program into multiple years of the pharmacy curriculum and pharmacy curricula across the country with the ultimate goal of training future practitioners to have an impact on safe use of medications for patients in their communities.

Impact of pharmacist-led education on first-year Family Medicine residents' prescription knowledge

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Learning Objectives:

1. Understand challenges facing first-year medical residents.
2. Identify medication classes and areas for pharmacist intervention.
3. Evaluate the usefulness of pharmacist-led education in teaching prescription knowledge.

Purpose:

Medication and prescribing errors are commonly reported in the first year of medical residency since interns are developing prescription writing skills. In a South Carolina Family Medicine Residency, 21% of prescriptions contained errors. Developing effective prescribing skills can lead to greater office efficiency, which is essential given the ever-changing burden of electronic health records and pressure to increase patient visits. Pharmacist-led informative didactic lectures have demonstrated a significant decrease in medication errors. The purpose of this educational quality improvement pilot project is to use pharmacist-led education to reinforce knowledge of prescription writing for first-year medical residents.

Methods:

This project will take place at a Family Medicine residency in the Midwest with six interns. A list of the top one hundred prescribed drugs was identified. Since this is being conducted at a Family Medicine Residency, drugs were prioritized by relevance to scope of practice. Materials for the educational sessions were developed by the clinical pharmacist and pharmacy resident based on these identified top drugs. Within the first quarter of the educational year educational sessions were presented by pharmacists. The interns will take an anonymous pre-test before the sessions; participate in three one-hour long educational sessions; and complete an anonymous post-test. Finally, an anonymous survey will be administered to the residents six months after the conclusion of the educational sessions to assess their satisfaction with the knowledge learned and applicability to practice.

Results:

A total of 6 interns completed the education sessions and the pre- and post-tests. The average score on the pre-test was 24.83%. The lowest score on the pre-test was 9/51 (17.64%), and the highest score was 18/51 (35.29%). The average score on the post-test was 50.3%. The lowest score on the post-test was 20/51 (39.22%), and the highest score was 29/51 (56.86%). The average test score compared between the pre-test and post-test doubled. The satisfaction survey results are pending completion and analysis. Results will be presented at Ohio Pharmacy Resident Conference.

Conclusions:

Pharmacist education is an effective tool enhancing medical resident's knowledge about prescriptions and prescription writing.

Long Term Renal Outcomes of Patients on Vancomycin Plus Piperacillin/Tazobactam Therapy Compared to Patients on Vancomycin Plus an Alternate Antipseudomonal Beta-Lactam

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UAN: 0048-0000-23-097-L01-P

Learning Objectives:

1. Discuss renal injury incurred with concurrent vancomycin and antipseudomonal beta-lactam therapy administration
2. Describe the rates of new renal impairment associated with vancomycin plus antipseudomonal beta-lactam therapy
3. Compare length of stay, new dialysis needs, and mortality in a community hospital between patients treated with vancomycin plus piperacillin/tazobactam to patients treated with vancomycin plus an alternate antipseudomonal beta-lactam (cefepime or meropenem)

Purpose:

The aim of this study was to compare renal outcomes—including new renal replacement needs, chronic impairment requiring regular provider monitoring, and complete recovery of baseline function—in patients who were treated with vancomycin plus piperacillin/tazobactam to patients treated with vancomycin plus an alternate antipseudomonal beta-lactam (meropenem or cefepime).

Methods:

This is a single-center, comparative, retrospective study performed at Mercy Health – Lorain Hospital comparing renal outcomes at discharge between patients treated with vancomycin plus piperacillin/tazobactam therapy to patients treated with vancomycin plus an alternate antipseudomonal beta-lactam (cefepime or meropenem). Patients were included if they were ≥18 years of age, admitted to Mercy Health – Lorain Hospital between January 1, 2018 and October 31, 2022, and if started on vancomycin plus an antipseudomonal beta-lactam (piperacillin/tazobactam, cefepime, meropenem) with concurrent therapy lasting ≥3 days. Behavioral health patients, labor and delivery patients, pregnant females, and patients with known pre-existing renal replacement needs were excluded. The primary outcome was to determine if a difference in renal outcomes at discharge exists in patients who have been treated with vancomycin plus piperacillin/tazobactam compared to patients who have been treated with vancomycin plus an alternate antipseudomonal beta-lactam at a community hospital. The secondary outcomes of the study were to determine if the rates of renal failure, length of hospital admission, and rates of mortality differ between the two study arms. A retrospective chart review was performed on eligible patients to collect data regarding vancomycin plus antipseudomonal beta-lactam therapy (piperacillin/tazobactam, cefepime, and meropenem). One arm of the study included patients on vancomycin plus piperacillin/tazobactam and the other arm included patients on vancomycin plus an alternate antipseudomonal beta-lactam (cefepime or meropenem).

Results:

Final results will be presented at the 2023 Ohio Pharmacy Residency Conference.

Conclusions:

Final results, statistical analysis, and conclusions will be presented at the 2023 Ohio Pharmacy Residency Conference.

Evaluation of Early Transition to Oral Antihypertensives After Acute Aortic Dissection

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UAN: 0048-0000-23-098-L01-P

Learning Objectives:

1. Discuss the optimal management of anti-impulse control in patients with acute aortic dissection
2. Describe the impact of earlier transition from continuous infusion antihypertensives to oral antihypertensives on intensive care unit length of stay and other patient-centered outcomes

Purpose:

Anti-impulse control with intravenous (IV) antihypertensives is critical for early management of acute aortic dissection. However, the optimal transition point and impact from IV to oral antihypertensives after goal hemodynamics has been achieved remains unclear. The goal of this study was to evaluate the safety and efficacy of transition times from IV to oral antihypertensives after acute aortic dissection.

Methods:

A single-center retrospective cohort study was performed in patients who presented for acute aortic dissection. Groups were allocated based on achieving full transition to oral antihypertensives within or greater than 48 hours from initiation of continuous IV infusion (i.e., early vs delayed). The primary outcome was intensive care unit (ICU) length of stay (LOS). Secondary outcomes included hospital LOS, total volume infused from antihypertensives, incidence and duration of central and arterial lines, need for vasopressors, and in-hospital mortality.

Results:

A total of 427 patients were screened for inclusion and 54 were included for final analysis. ICU LOS was significantly shorter in the early transition group (3.1 [2.6 – 5.5] days vs 6.2 [3.8 – 8.5] days, p=0.015). Hospital LOS was also significantly shorter in the early transition group (6.0 [4.1 – 8.6] days vs 11.1 [7.1 – 16.8] days, p=0.001]. Total volume infused and duration of central and arterial lines were also shorter in the early transition group. There were no significant differences in need for vasopressors or in-hospital mortality.

Conclusion:

Early transition to oral antihypertensives within 48 hours was associated with shorter ICU and hospital LOS among patients with acute aortic dissection. However, the study was small and additional studies are needed to support this conclusion.

Time in RASS Goal with the Addition of Ketamine in the ICU

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Learning Objectives:

1. Review strategies for sedation and analgesia for mechanically ventilated patients in the ICU
2. Identify if continuous ketamine increases time within RASS goal in mechanically ventilated patients when added to continuous sedation and analgesia

Purpose:

Compare time within RASS goal with the addition of ketamine to continuous sedation and analgesia to continuous sedation and analgesia alone for mechanically ventilated patients in the ICU

Methods:

This retrospective cohort study was conducted in the medical and surgical intensive care units of three OhioHealth hospitals, Riverside Methodist Hospital, Grant Medical Center, and Doctors Hospital from January 1st, 2018 to September 1st, 2022. Adult patients were included if they were mechanically ventilated and had an order for continuous sedation and analgesia for 48 hours. Patients were further divided into those who did and did not receive continuous infusion ketamine. Exclusion criteria included pregnancy, neuromuscular blockade, admission diagnosis of status asthmaticus or status epilepticus, or infusions paused for more than 4 hours. The primary outcome was time within Richmond Agitation Sedation Scale (RASS) goal during the 48 hours of continuous sedation and analgesia with or without ketamine. Secondary outcomes included hours of Critical Care Pain Observation Tool (CPOT) score ≥ 2, hours where Confusion Assessment Method for the Intensive Care Unit (CAM-ICU) was positive, ICU length of stay, duration of intubation, incidence of tracheostomy, and disposition. This study required 253 patients in each group to meet 80% power to detect a 15% difference at α=0.05.

Results:

In all, 738 patients were identified but only 178 met exclusion criteria – 112 in the ketamine group and 66 in the no ketamine group. Patients receiving ketamine were significantly more likely to be younger, intravenous drug users with lower APACHE II scores. There was no significant difference in hours within RASS goal between patients who did and did not receive ketamine (25.8% vs 21.3%, p=0.668). While ketamine use was associated with an increase in hours of CPOT score ≥ 2 (9.5 vs 5.8, p<0.001), it showed a decrease in hours where CAM-ICU was positive (37.4 vs 44.6, p=0.001). Regarding patient outcomes, ketamine use was associated with more days in the ICU (15.0 vs 11.5, p = 0.017), increased incidence of tracheostomy (36.1% vs 15.4%, p = 0.003), and decreased mortality (9.1% vs 33.8%, p = 0.004). A multivariate analysis adjusting for age, intravenous drug use, and APACHE II score annulled all significance except for hours where CAM-ICU was positive and incidence of tracheostomy.

Conclusions:

Ketamine is being utilized later in ICU course in a different population than many patients initiated on continuous sedation and analgesia. The benefits of utilizing ketamine in mechanically ventilated adults requiring continuous sedation and analgesia to increase time in RASS goal remain unclear. Further studies are warranted to investigate the correlation between ketamine and decreased hours where CAM-ICU was positive.

Evaluation of Paclitaxel Hypersensitivity Reactions: A Gap Analysis to Assess the Need for a Hypersensitivity Reaction Protocol

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Learning Objectives

1. Review literature findings to determine safe paclitaxel administration practices to mitigate hypersensitivity reactions
2. Assess OhioHealth's current practice to determine if a paclitaxel rechallenge protocol is needed and generate cause for a quality improvement project.

Purpose:
Paclitaxel is associated with high rates of immediate hypersensitivity reactions that requires pre-infusion medications for successful treatment. Protein-bound paclitaxel is a newer formulation that carries a lower risk for hypersensitivity reactions, which some providers may choose to initiate inappropriately. This practice can be problematic due to the perceived high cost of protein bound paclitaxel and increased compounding burden. OhioHealth currently does not have a standardized policy to rechallenge patients experiencing hypersensitivity reactions to paclitaxel. The purpose of this study is to assess the need to implement a rechallenge protocol for patients experiencing hypersensitivity reactions to paclitaxel and to generate cause for a follow-up quality improvement project to implement a protocol.

Methods
We pursued a retrospective chart review of all adults patients, 18 years and older, that received chemotherapy at an OhioHealth outpatient infusion center and has documented treatment history of receiving both paclitaxel and protein bound paclitaxel during fiscal year 2018-2022 (July 1, 2017 to June 30, 2022). Hypersensitivity reactions were recorded or graded according to Common Terminology Criteria for Adverse Events V.5 guidelines. Additionally, medication dosing was assessed in terms of various weight scalars. Patients who are being treated for first line protein bound paclitaxel indications were excluded from this project.

Results:
Our screening yielded 21 patients eligible for evaluation. Most patients that were included in this study were either grade 2 or 3 according to CTCAE V.5 guidelines. By our determination, 3 patients were considered grade 1, 7 patients were grade 2, 8 patients were grade 3, 4 patients were grade 2, no patients were grade 5, and 1 patient did not meet CTCAE criteria. Of the 21 patients evaluated, 16 (76.2%) patients were considered eligible candidates to be rechallenged on paclitaxel.

Conclusion:
Cancer patients experiencing hypersensitivity reactions to paclitaxel are not uncommon and reaction rates diminish after subsequent infusions. Having an established protocol to rechallenge patients may yield significant cost savings for patients and the healthcare system

Evaluating the Impact of Potassium Containing Fluids on Patient Outcomes in the Treatment of Diabetic Ketoacidosis in Adults

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UAN: 0048-0000-23-101-L01-P

Learning Objectives:

1. Determine the impact of guideline recommended administration of potassium containing fluids on length of stay in patients with a diagnosis of diabetic ketoacidosis.
2. Identify risk factors that predispose patients to complications and extended length of stay.

Purpose:

Diabetic ketoacidosis (DKA) is a life-threatening complication of diabetes where insulin is not readily available for glucose regulation. Aggressive correction of elevated glucose levels with intravenous insulin is an essential component for treatment. As a result, hypokalemia, a common side effect of insulin administration, may occur and lead to further complications and increased length of stay. The primary purpose of this study was to determine the impact of guideline recommended administration of potassium containing fluids within one hour of initial diagnosis of DKA on patient length of stay in the intensive care unit (ICU).

Methodology:

This study was a retrospective, multi-center cohort analysis of patients admitted to University Hospitals and its community hospital affiliations for DKA between October 1, 2016 and October 31, 2022. Patients 18-75 years old with diagnosis of DKA confirmed by, but not limited to, the following laboratory parameters: pH ≤7.3, serum bicarbonate ≤15, glucose ≥250, anion gap >10, and potassium ≤5.2 and ≥3.3 were included. Patients were divided into two groups, patients who received potassium containing fluids within one hour of diagnosis and those who did not. Patients who had an initial serum potassium >5.2 or <3.3, had a GFR <30 or end stage renal disease, who were taking a sodium-glucose cotransporter 2 inhibitor, who were not initiated on an insulin infusion and who were admitted to the ICU for non-DKA related diagnoses were excluded. The primary endpoint of this study was to assess the impact on length of stay in the ICU based on potassium administration and requirements. The primary endpoint was examined using a student t-test. Secondary endpoints examined all-cause mortality, patient demographics, time to wean off insulin infusion, time to DKA resolution, rate of hypoglycemic events and diabetic complications, rate of symptomatic hypokalemia, and total length of stay. The secondary endpoints were examined using a student t-test or chi-square test as appropriate.

Results:

Final results will be presented at the 2023 Ohio Pharmacy Resident Conference.

Conclusion:

To be presented at the 2023 Ohio Pharmacy Residency Conference.

Facilitators and Barriers to Patient Directed Services in Community Pharmacies of Southeast Ohio – A Snapshot of Relevant Challenges to the Community Pharmacy

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Learning Objectives:

1. Describe the process of developing a pharmacist services survey
2. Review findings of service facilitators in the community pharmacy
3. Review findings of service barriers in the community pharmacy

Purpose:

The landscape of pharmacy practice in Ohio has changed with a shift of integrating the community pharmacist into patient care services. Reduction in reimbursement rates for prescription fills, job satisfaction, the COVID-19 pandemic, and provider status all contributed to the change in the role of a community pharmacist. The current landscape challenge offers a unique opportunity to pursue a variety of new services. Most counties in southeast Ohio are designated as Health Practitioner Shortage Areas. Pharmacists who work in these areas are qualified healthcare practitioners who can support other unmet needs in the community setting. However, many barriers to service implementation exist. The objective of this survey is to determine pharmacist-identified facilitators and barriers in the implementation of patient directed services in rural community pharmacies.

Methods: Pharmacists working within identified rural counties were surveyed on their perceptions of facilitators and barriers to implementing a variety of services. A survey, consisting of multiple choice and ranked order questions, was distributed to community pharmacies. Data collection was established through electronic methods. Survey invitations were sent out to the responsible person multiple times, beginning 3/6/23. The survey was open for 4 weeks and data was analyzed using descriptive statistics.

Results:

Preliminary review of respondents indicated pharmacies were more likely to provide medication delivery, medication synchronization, and immunizations compared to other services. No respondents indicated that they provide long acting injectable administration, telehealth, or work under collaborative practice agreements

Conclusions:

The pharmacy profession needs tailored, effective, and scalable data collection surveys in order to determine the location-specific capabilities of community pharmacies and to advocate for our unique role in public health.

Impact of antimicrobial stop dates for pneumonia and COPD exacerbations on 30-day readmission rates

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Learning Objectives:

1. Discuss guideline-directed antimicrobial treatment choice and duration on community-acquired pneumonia and community-acquired pneumonia and COPD exacerbations
2. Review 30-day readmission rates before and after initiation of antimicrobial stop dates

Purpose:

Antimicrobial stop dates were required for community acquired pneumonia (CAP), hospital acquired pneumonia (HAP), and chronic obstructive pulmonary disease (COPD) exacerbations at St. Rita's Medical Center (SRMC) in June 2022. The primary purpose of this study is to compare the 30-day readmission rate of patients treated for HAP, CAP, and COPD exacerbations before and after the antimicrobial stop date implementation. According to internal data from SRMC, the 30-day readmission and mortality rate was approximately 17% for pneumonia and 20% for COPD exacerbation in 2021. This study will expand on the current guidelines for treatment of pneumonia and COPD and the appropriateness of the therapy chosen for inpatient and discharge antibiotics. This study will also allow for a comparison of duration of antibiotic therapy and any *Clostridioides difficile* infections that may have resulted due to antibiotic use. If there is no significant change in 30-day readmission, this will demonstrate appropriate treatment while helping to reduce overuse and decrease resistance.

Methods:

This retrospective chart review of inpatient medical records will compare adult patients in 2021 and 2022 between June and September that have been diagnosed with CAP, HAP, or COPD exacerbation per ICD-10 codes and require antibiotic treatment. Patients were excluded if they were < 18 years old, on an antibiotic for an indication other than CAP, HAP, or COPD exacerbation, admitted with an active *Clostridioides difficile* infection, had antibiotics initiated in the ICU, acquired a type of pneumonia that require longer durations of therapy, or COVID positive. The primary outcome is to determine the prevalence of 30-day readmission rates for June through September in 2021 versus 2022. Secondary outcomes include evaluating appropriateness of inpatient and discharge antibiotic choice, total antibiotic duration of therapy, and 30-day readmission rates of patients with *Clostridioides difficile* infections.

Results:

Data analysis in progress

Conclusions:

Results and conclusions will be presented at the Ohio Pharmacy Resident Conference

Evaluating the clinical utility of *DPYD* and *UGT1A1* pharmacogenomic testing at a community cancer center

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UAN: 0048-0000-23-104-L01-P

Learning Objectives:

1. Recognize the patient outcomes impacted by pharmacogenomic testing
2. Identify commonly prescribed antineoplastics that may be impacted by pharmacogenomic testing and the toxicities a patient may be at risk for with certain pharmacogenomic abnormalities, if not properly reduced based on genetic variation

Purpose:

Up to five percent of Caucasians possess a DPYD partial deficiency, while eight percent of patients with African ancestry may have a deficiency. Actionable UGT1A1 polymorphisms have been reported in up to 23% of patients. While rare, serious complications may occur if full dose chemotherapy is given to these intermediate and poor metabolizers. ASHP reports improved patient outcomes and lower cost of treatment with pharmacogenomic testing. Despite this promising potential, routine pharmacogenomic testing is not yet recommended by the National Comprehensive Cancer Network or the American Society of Clinical Oncology. Guidance for management of patients with actionable phenotypes at *DPYD* and *UGT1A1*, which are implicated in the metabolism of capecitabine/fluorouracil and irinotecan, respectively, is provided by CPIC and DPWG. Unfortunately, recommendations for dosing modifications are not established for intermediate UGT1A1 metabolizers, specifically. Despite promising results, NCCN/ASCO have no formal recommendations, and therefore, routine testing is not considered standard of care across the country.

Methods:

This is a single-health system, retrospective study which included patients who underwent *DPYD- or UGT1A1*-targeted pharmacogenetic testing at St. Elizabeth Healthcare between November 2020 to November 2022. Results were compared to a historic patient group who received a therapy of interest, but did not receive pharmacogenomic testing, between November 2018 to October 2020. This historic population was utilized to compare clinical outcomes between the patients who underwent pharmacogenomic testing and those that did not. The primary outcome was determining the prevalence of actionable *DPYD* and *UGT1A1* genotypes. Secondary outcomes included time to testing results, percent of tests resulted prior to initiation of chemotherapy, percent of pharmacist recommendations implemented by providers, unplanned hospitalizations after chemotherapy initiation, and delays in therapy due to chemotherapy toxicity.

Results:

Results will be presented at the Ohio Pharmacy Resident Conference.

Conclusion:

Conclusions will be presented at the Ohio Pharmacy Resident Conference.

Initiation of a Medication Assisted Treatment Program for Opioid Use Disorder in an Emergency Department

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Learning Objectives:

1. Identify key components of a medication assisted treatment program in the emergency department.
2. Discuss the importance of a medication assisted treatment program in helping reduce the opioid epidemic.

Purpose:

In 2020, the National Institution on Drug Abuse estimated 2.7 million people were diagnosed with an opioid use disorder (OUD) and 92,000 died of a drug-related overdose. As the epidemic continues, emergency departments serve as a critical access for individuals with OUD. The National Institution on Drug Abuse, the American Society for Addiction Medicine, and the World Health Organization are recommending medication-assisted treatment, specifically in emergency departments. Emergency departments have an opportunity to identify individuals in need of treatment, initiate evidence-based treatment, and provide the referral management.

Methods:

To implement a medication-assisted treatment (MAT) program in the ED, outcomes of existing programs were evaluated and current literature was reviewed to assess protocols. The protocol will have screening methods, inclusion criteria, treatment algorithms, and discharge procedures. When individuals arrive in the ED, they will either self-identify as having opioid use disorder or be identified by ED staff using validated screening tools. If the patient is willing, their level of withdrawal will be assessed using the COWS scale. A complete substance abuse history will be obtained. If the patient meets the criteria to participate, an emergency medicine physician or advanced practice provider will offer buprenorphine treatment. At the time of discharge, a referral will be made to a clinic to take over the patient's maintenance treatment. After implementation, feedback along with data will be collected to determine the program's effectiveness including descriptive data and percentage adherence to MAT. In the future, if the program proves to be effective other resources and hospital departments could become intergraded into the program.

Results:

Patients will have fewer complications and will be able to safely withdrawal from opioids. Patients will be able to sustain recovery.

Conclusion:

Final results and conclusions will be presented at the Ohio Pharmacy Residency Conference.

Antimicrobial Prescribing Practices in Orthopedic Procedures

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UAN: 0048-0000-23-106-L01-P

Learning Objectives:

1. Review the current guidelines for the use of antimicrobial prophylaxis prior to orthopedic procedures
2. Discuss the antimicrobial prescribing patterns and their relation to post-operative infections

Purpose:
The 2013 American Society of Health-System Pharmacists Clinical Practice Guidelines for Antimicrobial Prophylaxis in Surgery recommend the duration of prophylactic antimicrobial agents for surgery to not exceed 24 hours post-operation. Institutional policy for pre-operative antibiotics in orthopedic procedures includes one dose of cefazolin prior to incision. Vancomycin or clindamycin may be utilized if there is known Methicillin-resistant *Staphylococcus aureus* colonization or β-lactam allergies. Complications of extending post-operative antibiotics include increased antibiotic resistance, increased incidences of *Clostridioides difficile* infection (CDI), and increased drug costs. This retrospective, observational study was conducted to investigate prescribing practices of perioperative antimicrobial therapy at the University of Toledo Medical Center (UTMC).

Methods:
Adult patients who received total hip arthroplasty (THA) or total knee arthroplasty (TKA) at UTMC between January 1, 2018, to July 31, 2022, were included. The primary outcome was to assess the total institutional guideline compliance for antimicrobial therapy in THA/TKA procedures. Secondary endpoints included assessing appropriate antimicrobial agents, dosing, and duration prescribed for THA/TKA procedures. The incidence of post-operative surgical site infections and CDI within 30 days of the index admission was also assessed. Descriptive statistics were used to analyze the data collected.

Results:
A total of 800 patients were included in this study. The primary outcome revealed 16.25% (130 patients) THA/TKA patients received appropriate antimicrobial therapy. The suboptimal institutional guideline compliance was driven by the inappropriate selection of pre-operative antibiotics that did not match institutional policy. Within 30 days of the index admission, 8.9% of patients developed surgical site infections and 0.1% developed CDI.

Conclusions:
Patients undergoing THA or TKA received inappropriate antimicrobial therapy as outlined by institutional policy. Targeted antimicrobial stewardship strategies such as provider education, policy modification, and order set optimization may improve adherence to guideline-directed therapy.

Intravenous Diltiazem versus Metoprolol for Patients with Atrial Fibrillation with Rapid Ventricular Response with a History of Heart Failure with Reduced Ejection Fraction

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Learning Objectives:

1. Identify safety concerns by reviewing any worsening outcomes of HF symptoms resulting from the use of intravenous diltiazem compared to metoprolol in acute atrial fibrillation (Afib) treatment.
2. Analyze efficacy of rate control for both agents by comparing heart rate at baseline versus 30 minutes after drug administration.

Purpose:
Limited evidence exists regarding the safety of intravenous (IV) diltiazem for acute management of AFib with rapid ventricular response (RVR) in those with heart failure with reduced ejection fraction (HFrEF). While guidelines recommend against chronic use of calcium channel blockers in these patients due to their negative inotropic effects, a few studies have shown diltiazem may be more effective acutely in rate control compared to beta-blockers. The purpose of this study was to evaluate the safety of diltiazem in patients with HFrEF who presented to the emergency department (ED) in AFib with RVR.

Methods:
This retrospective, single center study conducted from June 2017 to June 2022 included adult patients admitted to the ED with AFib with RVR and a history of HFrEF treated with IV diltiazem or metoprolol. Those who received both agents, required cardioversion, or were pregnant were excluded. Primary outcomes evaluated worsening signs of HF, hypotension, ≥15% reduction in blood pressure (BP), and bradycardia. Secondary outcomes compared the efficacy of rate control within 30 minutes and assessed ED length of stay (LOS), hospital LOS, and in-hospital mortality.

Results:
Fourteen patients were included (10 diltiazem vs 4 metoprolol). Mean age was 64.6 years and 37.5% presented with new onset Afib. Mean ejection fraction was 29.8%. Three patients experienced worsening signs of HF with diltiazem (30%) versus two with metoprolol (50%). There was no difference in hypotension or bradycardia between groups, however 60% of patients who received diltiazem experienced ≥15% reduction in BP compared to 25% who received metoprolol. Rate control within 30 minutes was achieved more frequently with diltiazem (50%) compared to metoprolol (25%).

Conclusions:
Based on preliminary results, data support safety and efficacy of diltiazem; however, due to small sample size more studies should be conducted. Final conclusions will be presented at the Ohio Pharmacy Resident Conference.

Impact of Electronic Medical Record Tools on Employee Engagement: A Quality Improvement Initiative

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Learning Objectives:

1. Explain the utility of electronic medical record based tools for communication and prioritization
2. Describe a single institutional initiative to improve employee engagement

Purpose:

Understanding the gaps in engagement can help to improve a team's dynamic and improve pharmacists' impact on patient care. An institutional employee engagement survey identified communication between teams and workload-related stress as opportunities for improvement within the pharmacy department. The pharmacy enterprise implemented two new electronic medical record (EMR)-based tools: hand-off tools to assist with inter-departmental communication and pharmacy patient service (PPS) for prioritization of high-risk patient populations. The aim of this quality improvement initiative is to determine the impact of implementation of EMR-based tools on employee engagement.

Methods:

A quality improvement initiative was performed. In April 2022, the uniform hand-off process and PPS utilization between unit-based pharmacists and clinical specialists were implemented. Data from the pharmacist utilization of the EMR tools was compiled via the creation of a cloud-based dashboard in September 2022. Employee engagement was measured by survey scores based on a 5-point Likert scale from two statements; "Communication between teams/ department is effective across the organization" and "The amount of job stress I feel is reasonable" from the June 2021 and December 2022 surveys.

Results:

A total of 42 surveys were obtained pre-implementation and 36 post-implementation. Communication scores increased post-implementation in both the clinical specialist and unit-based pharmacist groups (absolute changes of 0.28 and 0.20, respectively). Job stress scores increased post-implementation in both the clinical specialist and unit-based pharmacist groups (absolute changes of 0.14 and 0.17, respectively).

Conclusions:

The utilization of EMR-based tools may contribute to the improvement in the overall pharmacist engagement scores. Additionally, the creation of the productivity dashboard allows for transparency of expectations between the managers and the pharmacist groups

Efficacy and safety of various dextrose rates in acute diabetic ketoacidosis

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Learning Objectives:

1. Outline the current guideline recommendations for management of diabetic ketoacidosis (DKA).
2. Discuss the efficacy and safety of an institutional protocol that utilizes fixed-rate dextrose infusions in combination with a titratable insulin infusion for DKA management.

Purpose:
National guidelines recommend fixed rate insulin infusion in conjunction with variable rate dextrose infusion for the management of DKA. Limited data is available to assess a fixed rate dextrose infusion with a variable rate insulin infusion. The purpose of this study is to evaluate the efficacy and safety of several different dextrose rates in the context of an institutional protocol that utilizes a titratable insulin infusion for treatment of DKA.

Methods:
This was a retrospective, single-center, cohort study approved by our institutional review board. The primary outcome was the time to resolution of DKA between various dextrose rates (50 mL/hr, 75 mL/hr, 100 mL/hr, and 125 mL/hr; <1 mL/kg/hr and ≥1 mL/kg/hr). Secondary outcomes included inappropriate transition off of DKA protocol, incidence of insulin drip rate falling below 0.05 units/kg/hour, change in dextrose infusion rate from initial rate, hospital length of stay, incidence of hypoglycemia, hypokalemia and hypophosphatemia.

Results:
A total of 413 patients were screened and the final analysis included 196 patients. There was no statistically significant difference in the primary outcome between the 50 mL/hr, 75 mL/hr, 100 mL/hr, and 125 mL/hr groups (median time to resolution of DKA were 7.38 vs 9 vs 8.17 vs 5.65, P value 0.469). There was no statistically significant difference in the primary outcome between the <1 mL/kg/hr and ≥1 mL/kg/hr groups (median time to resolution were: 8.17 and 6.32, P value 0.091). There was a high incidence of inappropriate transition off of the DKA protocol, insulin infusion rate falling below 0.05 units/kg/hr, hypoglycemia, hypokalemia and hypophosphatemia.

Conclusions:
There was no significant difference in time to resolution of DKA, but secondary outcome analyses revealed a need for reappraisal of our institutional protocol.

Incidence of Upper Gastrointestinal Bleeding in Intensive Care Unit Patients with Post-Pyloric Feeding

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Learning Objectives:

1. Discuss stress ulcer prophylactic treatments including pharmacotherapy and enteral nutrition (EN).
2. Review current literature and evidence-based guidelines for stress ulcer prophylaxis (SUP).

Purpose:
Patients in the intensive care unit (ICU) are at a greater risk of stress ulcers, which may result in upper gastrointestinal bleeding (GIB). Strategies to reduce risk of upper GIB include EN and/or pharmacotherapy. Current evidence for the benefit of EN is based on gastric feeds, which deliver food directly to the stomach. Post-pyloric feeds, which deliver food to the duodenum or jejunum, have less gastric buffering effect, and may result in less SUP benefit. Published information about the SUP potential of post-pyloric EN is lacking.

Methods:
This was a retrospective study of critically ill patients receiving post-pyloric EN with/without SUP, from September 1st, 2017 to September 1st, 2022. Inclusion criteria are ≥18 years old, admitted into the ICU, received post-pyloric tube feeds at a rate ≥20 mL/hr and for ≥72 hr. Exclusion criteria include pregnancy or lactation, evidence of upper GIB prior to placement of post-pyloric feeding tube, history of complete gastrectomy, or burn patients. The primary outcome is to compare the calculated incidence of upper GIB to literature-reported values for unspecified EN. Secondary outcomes are to describe SUP treatment patterns, determine the incidence of nosocomial infections (HAP/VAP or CDI), identify potential contributing risk factors for upper GIB, and compare the incidence of upper GIB between those who did and didn't receive SUP as well as in those who did and didn't have associated risk factors.

Results:
Data analysis is ongoing, and results will be presented at the Ohio Pharmacy Residency Conference.

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

Characterizing the progression of advanced heart failure in patients receiving inotropic therapy in the sacubitril/valsartan era

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Learning Objectives:

1. Evaluate the existing literature surrounding the recommendations for RAAS inhibition in patients with HFrEF.
2. Identify the duration of inotrope therapy between RAAS inhibitors and assess if treatment should be approached differently based on agent.

Purpose:
Angiotensin receptor-neprilysin inhibitors (ARNI) have improved mortality compared to angiotensin-converting enzyme inhibitors (ACE-i) and angiotensin receptor blockers (ARB) in patients with heart failure (HF). Despite maximally tolerated guideline-directed medical therapy, patients with advanced HF may progress to chronic inotrope therapy. While literature suggests ARNI may prevent clinical HF progression and delay time to inotrope dependence, evidence is lacking regarding its effect on duration of inotrope use prior to destination event, defined as left ventricular assist device, transplant, or death. The aim of this study was to better anticipate a patient's time from starting inotrope to destination event.

Methods:
This IRB-approved retrospective cohort study included adults on chronic inotropes, who had an ejection fraction of <40% prior to inotrope initiation and were on renin angiotensin aldosterone system (RAAS) inhibition with an ACE-i/ARB or ARNI for at least 30 days. The primary outcome was duration of chronic inotrope therapy, defined as time from inotrope initiation to destination event. Secondary outcomes included time from RAAS inhibition to inotrope initiation, time from RAAS inhibition to destination event, discontinuation of RAAS inhibition prior to inotrope initiation, and incidence of destination event type. All outcomes were analyzed using either the two-sample t test or Chi-square test.

Results:
Of the patients that were included, 50 and 51 were treated with an ACE-i/ARB or ARNI, respectively. Baseline demographics were similar between groups except more patients treated with an ARNI were managed on a RAAS inhibitor and beta blocker prior to their hospital admission. The primary outcome for the ARNI group was 98.0 days vs. 96.9 days for the ACE-i/ARB group (p=0.973). There were no clinically or statistically significant differences in secondary outcomes.

Conclusion:
This small retrospective study did not show a statistically significant difference in duration of chronic inotrope therapy when patients were treated with an ACE-i/ARB versus an ARNI.

Implementation of controlled substance diversion monitoring software in a community health system

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Learning Objectives:

1. Review practice guidelines and recommendations for controlled substance handling.
2. Explain the results of implementing a controlled substance diversion prevention program (CSDPP) with analytical monitoring software.

Purpose:

The American Society of Health-System Pharmacists (ASHP) recently released "Guidelines on Preventing Diversion of Controlled Substances", which reinforced the recommendation for controlled substance diversion prevention programs (CSDPPs). Despite these recommendations, there are few research-based publications regarding the use of analytic software in CSDPPs. Therefore, a study was conducted to determine the benefit of implementing a controlled substance diversion monitoring software program when used in conjunction with the Diversion Prevention Committee.

Methods:

In this Institutional Review Board-approved, retrospective study, data was collected for two groups to compare outcomes before and after the implementation of controlled substance diversion analytic monitoring software at St. Elizabeth Healthcare Edgewood, Florence, and Fort Thomas locations. Patients with an inpatient dispense of a controlled substance from the automated dispensing cabinet (ADC) were included. Exclusion criteria were ADC transactions from June and July of 2022, midazolam infusion dispenses, and lorazepam injection dispenses. Those injections and infusions were excluded due to a data communication error between the ADC and the software, which has since been corrected. Data will be analyzed for two groups, comparing live date (August 1st, 2022 to January 31st, 2023) versus six months prior (December 1st, 2021 to May 31st, 2022). The following data will be collected: whole dose wastes, administration delays greater than two hours, waste delays greater than two hours, unreconciled controlled substance dispense discrepancies, and overrides. All data is being recorded in a password protected document. Once collected, data will be analyzed between the comparator groups to assess the impact on the outcomes for risky controlled substance handling practices.

Results:

Data and collection analysis is currently in progress. Final results will be presented at the Ohio Pharmacy Resident Conference.

Conclusions:

Conclusions will be presented at the Ohio Pharmacy Resident Conference.

Comparing pharmacist-managed vancomycin dosing utilizing the traditional method versus InsightRx® Bayesian dosing software

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Learning Objectives:

1. Review the two different dosing methods of vancomycin: traditional method versus Bayesian AUC/MIC dosing method
2. Identify which dosing method had an increased percentage of therapeutic troughs
3. Evaluate if the Bayesian AUC/MIC dosing method has less adverse effects, is appropriate to utilize in critically ill and obese populations, and has less associated costs when compared to the traditional method

Purpose:
To evaluate the difference in the percentage of therapeutic troughs, safety, and economic outcomes between pharmacist-managed vancomycin traditional dosing and InsightRx® Bayesian AUC/MIC dosing.

Methods:
This IRB approved, retrospective chart review evaluated 400 hospitalized patients who were on intravenous vancomycin therapy at St. Elizabeth Youngstown Hospital from October 1, 2020 through October 1, 2022. The primary outcome is comparing the percentage of therapeutic troughs utilizing the traditional versus InsightRx® Bayesian AUC/MIC methods. Secondary outcomes include assessing rates of acute kidney injury, appropriateness of AUC/MIC dosing in critically ill and obese populations, and overall drug exposure. Costs evaluated will be vancomycin dosage, levels, and InsightRx® software.

Results:
A total of 304 patients met inclusion criteria: 140 in the traditional versus 164 in the AUC/MIC arm. There was statistical significance in patients reaching therapeutic levels, favoring the AUC/MIC method (P = 0.009, 38 patients traditional versus 68 patients AUC/MIC). A significance in time to reach therapeutic levels was also demonstrated (P = 0.070, 9.75 hours versus 9 hours). Statistically significant secondary outcomes include appropriateness of AUC/MIC dosing in the critically ill (P-value = 0.019), time to reach therapeutic levels in the obese population (P-value = 0.016), and total cumulative dose (P-value = 0.001), all favoring the AUC/MIC method. Statistical insignificant secondary outcomes include occurrence of acute kidney injury (P-value = 0.653), percentage of therapeutic levels in obese patients (P-value = 0.307), total cost of vancomycin therapy (P-value = 0.111), and total cost of vancomycin levels (P-value = 0.485).

Conclusion:
The AUC/MIC method reached therapeutic levels more often and at a quicker onset when compared to traditional dosing. No significant difference was found between the two dosing methods in regard to acute kidney injury. Further studies are warranted to determine if AUC/MIC dosing is appropriate in the critically ill and obese populations.

Incidence of bacteremia in pediatric patients with acute lymphoblastic leukemia (ALL) receiving fluoroquinolone (FQ) prophylaxis

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UAN: 0048-0000-23-114-L01-P

Learning Objectives:

1. Review current guidelines for febrile neutropenia prophylaxis in pediatric patients with ALL
2. Discuss the difference in incidence of bacteremia in ALL patients who received FQ prophylaxis versus ALL patients who did not receive FQ prophylaxis

Purpose:

Bacterial sepsis is the leading cause of morbidity and mortality in children receiving treatment for acute lymphoblastic leukemia (ALL). Research studies are limited on prophylactic fluoroquinolone (FQ) use in pediatric patients with ALL. Additionally, major cancer guidelines do not address antimicrobial prophylaxis in the pediatric patient population. This study aims to compare the incidence of bacteremia in pediatric patients with ALL receiving FQ prophylaxis versus pediatric patients with ALL who did not receive FQ prophylaxis.

Methods:

This is a single-center, retrospective chart review comparing the incidence of bacteremia in pediatric patients with ALL with or without FQ prophylaxis. Patients 0-18 years of age with ALL undergoing chemotherapy treatment at Children's Hospital of Michigan (CHM) between January 2016 and December 2022 were included. Patients with ALL who underwent a hematopoietic stem cell transplant (HSCT) as well as patients with an allergy to FQ were excluded. The primary outcome will be the incidence of bacteremia confirmed by positive blood culture. Secondary outcomes will include incidence of *Clostridioides difficile* infection, febrile neutropenia, duration of FQ prophylaxis, type of bacterial pathogen, pathogen susceptibilities, and admission to the intensive care unit (ICU).

Results:

Results will be presented at the 2023 Ohio Pharmacy Resident Conference.

Conclusions:

Conclusions will be presented at the 2023 Ohio Pharmacy Resident Conference.

Impact of expanding clinical pharmacy services on avoiding unnecessary costs

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UAN: 0048-0000-23-115-L04-P

Learning Objectives:

1. Describe the core principles and practical applications of pharmacoeconomic analysis.
2. Explain the impact of expanding clinical pharmacy services on cost-avoidance and operational efficiency.

Purpose:

A cost-avoidance analysis assesses the financial impact of interventions by identifying the incremental costs if the interventions had not been implemented. A literature gap exists in evaluating the impact of expanding clinical pharmacy services to evening shifts and its effect on cost-avoidance. The goal of this quality improvement project was to measure the cost-avoidance of expanding clinical pharmacy services to "off shifts." We posit that expanding clinical pharmacy services to 16 hours daily and to critically ill patients and others will result in increased cost-avoidance.

Methods:

This single-center, retrospective, descriptive, quality improvement study was conducted at OhioHealth Grant Medical Center from September 2022 to January 2023. The OhioHealth Office of Human Subjects Protections determined this project is not human subjects research. The primary aim of this study was to compare the cost-avoidance resulting from clinical pharmacy services before and after an increase in staffing. We estimated cost-avoidance by translating interventions into equivalent cost savings using evidence-based literature. Clinical pharmacy service interventions were recorded for two weeks before the staffing change, followed by a 16-week washout period, and then continued for two weeks after service expansion. The secondary aim was to measure operational metrics around order management, specifically the time required to complete a pharmacist consult and the median time to order verification. Data was summarized using descriptive statistics.

Results:

Data from 840 i-Vents, 25,530 orders, 737 consults, 620 patients, and 67 pharmacists were analyzed. Clinical pharmacy service interventions resulted in an estimated cost-avoidance of $141,083.03 before staffing changes and $171,271.30 after staffing changes, a difference of $30,188.27. The median time to order verification improved from 4.99 minutes pre-intervention to 4.75 minutes post-intervention. The median time to consult completion changed from 87.5 minutes pre-intervention to 91 minutes post-intervention.

Conclusions:

Expanding clinical pharmacy services was associated with an increase in estimated cost-avoidance, while operational efficiencies remained relatively unchanged.

Ceftriaxone vs cefazolin+gentamicin for presumptive antimicrobial coverage in type III open fractures

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UAN: 0048-0000-23-116-L01-P

Learning Objectives:

1. Interpret the update in recommendations for antimicrobial coverage for open fractures
2. Differentiate clinical outcomes before and after transition of presumptive antimicrobial coverage in type III open fractures

Purpose:

Open fractures are classified by the Gustilo-Anderson fracture grading schema. Antimicrobial therapy is based on recommendations from the Eastern Association for the Surgery of Trauma. They recommend presumptive cefazolin + gentamicin in type III fractures. Concerns have risen that gentamicin is not an ideal presumptive antimicrobial. It requires dosing/compounding by pharmacy and comes with a risk of acute kidney injury (AKI). Ceftriaxone monotherapy has been suggested as an alternative. It has standard dosing, sufficient coverage and a lower risk of AKI. We hypothesized that ceftriaxone is comparable to cefazolin + gentamicin in preventing infections for post – traumatic open fractures.

Methods:

We assessed patients who presented to GMC with type III open fractures between 08/2020 and 08/2022. Patients were divided based on receiving ceftriaxone or cefazolin + gentamicin (control). The primary outcome was post-traumatic infection rates at 90 days. Secondary outcomes included time to antibiotic administration and AKI. All data was assessed for normality utilizing a Shapiro-Wilk test. Continuous variables were assessed via ANOVAs, independent samples T-Tests, or Mann-Whitney U test. Chi-squared or Fisher's exact tests were utilized for categorical data. Statistical significance was defined *a priori* as $p < 0.05$.

Results:

There was no statistically significant difference in the primary outcome, with 4 infections in the ceftriaxone group and 4 in the control group (16% vs 22%, $p = .605$). Mean time to antimicrobial administration for ceftriaxone was 89.53 vs 147.58 (minutes) in the control group ($p = 0.225$), with a median time of 25 vs 98 (minutes) respectively. There was no statistically significant difference in rate of AKI between the two groups (1 vs 1, $p = .811$).

Conclusions:

We observed no significant difference in post-traumatic infections but a decrease in time to administration with ceftriaxone monotherapy versus cefazolin + gentamicin.

Development & implementation of an inpatient lipid monitoring and intervention protocol in patients taking second generation antipsychotics

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UAN: 0048-0000-23-117-L01-P

Learning Objectives:

1. Review the current treatment recommendations for lipid-lowering therapy according to the 2019 American College of Cardiology (ACC) and the American Heart Association (AHA) Guidelines on the Primary Prevention of Cardiovascular Disease (section 4.3).
2. Recognize potential pharmacist interventions that can be implemented to lower ASCVD risk in patients taking second-generation antipsychotics.

Purpose:

Second-generation antipsychotics (SGA) are used to manage psychosis and treat mental illnesses. SGAs have been associated with metabolic side effects that may occur within the first few weeks to three months after newly starting or switching the drug. Patients with psychiatric disorders are at an increased risk for obesity, hyperglycemia, hypertension, and dyslipidemia which all increase the risk for atherosclerotic cardiovascular disease (ASCVD). Incorporating lipid-lowering medications, including statin therapy, is one approach to lowering ASCVD risk. The purpose of this study was to develop an inpatient lipid monitoring and intervention protocol based on the 2019 ACC/AHA Guidelines for Primary Prevention to lower ASCVD risk in patients taking SGA.

Methods:

This single-center, prospective chart review evaluated adult patients ≥ 20 years admitted to Mercy Health St. Rita's Medical Center. Using evidence-based guidelines, a lipid monitoring and intervention protocol was developed for patients receiving SGAs. Through the protocol, pharmacists performed medication reconciliations, conducted primary ASCVD prevention screens, and recommended appropriate laboratory or physical assessment data to accurately assess ASCVD risk. Lipid-lowering medication recommendations were made based on guidelines, lipid panel values, comorbid conditions, and calculated ASCVD risk assessment scores. Pharmacists implemented physician-approved recommendations and documented all interventions. The primary outcome measure was the number of lipid-lowering interventions made for patients receiving SGAs. This project was determined to be exempt by the Bon Secours Institutional Review Board.

Results:

Data analysis in progress

Conclusions:

Results and conclusions will be presented at the Ohio Pharmacy Resident Conference

Clinical Impact of Continuous Glucose Monitors in Patients with Type 2 Diabetes on Non-Insulin Therapy

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UAN: 0048-0000-23-118-L01-P

Learning Objectives:

1. Review current guideline recommendations for the use of continuous glucose monitors (CGMs).
2. Discuss the benefits of CGMs in patients with type 2 diabetes on non-insulin therapies.

Purpose:

The American Diabetes Association (ADA) recommends utilizing CGMs for patients with type 2 diabetes treated with multiple daily insulin injections, continuous subcutaneous insulin, or even basal insulin alone, but the ADA does not provide specific recommendations for CGM use in patients with type 2 diabetes on non-insulin therapies alone. The objective of this quality improvement (QI) initiative was to determine if CGM therapy had an HbA1c lowering effect for patients with type 2 diabetes mellitus who are not on insulin therapy.

Methods:

This retrospective QI initiative evaluated patients in the Internal Medicine Center (IMC) at Summa Health who were started on CGM therapy for type 2 diabetes mellitus and were not on insulin at the time of initiation, nor had used insulin in the previous 3 months. Chart review was completed to collect all information. The primary endpoint was change in HbA1c from baseline. Secondary endpoints included changes in body mass index (BMI), difference in HbA1c in IMC patients utilizing CGMs vs patients not utilizing CGMs, and percent (%) of time in therapeutic glucose range, based on CGM data. The primary outcome was tested for median equality to zero via Wilcoxon signed rank test. Testing was two-sided with $p<0.05$ considered statistically significant. Secondary outcomes were summarized using descriptive statistics.

Results:

The baseline HbA1c was 8.3% at the time of CGM placement. The median change in HbA1c from baseline to post-CGM placement was -0.9 ($p=0.005$). There were no medication changes in 80% of the patients from pre-CGM HbA1c to post-CGM HbA1c; of the patients who had no medication changes there was a median change in HbA1c of -1.2 ($p=0.012$). Percent time in range was evaluated for a small subset of patients who had CGM reports available in their chart. The overall percent time in range was 84%. There was not a change in BMI class in any patients.

Conclusions:

Implementation of CGM therapy alone in patients with type 2 diabetes mellitus who are not on insulin therapy in our initiative showed a statistically significant improvement in HbA1c, regardless of any pharmacologic changes. These findings support CGM therapy utilization as a significant therapeutic option based on HbA1c effect.

Assessing the Impact of Medication Titration Velocity on Clinical Outcomes in Patients with Heart Failure with Reduced Ejection Fraction

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UAN: 0048-0000-23-119-L01-P

Learning Objectives:

1. Understand guideline directed medical therapy (GDMT), methods to assess severity of heart failure with reduced ejection fraction (HFrEF), and its utilization in the treatment of HFrEF
2. Assess heart failure outcomes when HFrEF medications are titrated to targeted GDMT doses in various time frames

Purpose:
Established literature indicates that guideline directed medical therapy (GDMT) reduces morbidity and mortality in heart failure with reduced ejection fraction (HFrEF) patients. Less is known if length of time to achieve GDMT impacts improvement in ejection fraction (EF), termed *titration velocity.* The study sought to determine if titration velocity of GDMT correlates to improvement in EF.

Methods:
Retrospective review of HFrEF (EF≤ 40%) patients on GDMT with baseline and follow-up echocardiograms. The primary objective was to determine if titration velocity to targeted GDMT correlates to improvement in EF. Secondary objectives included reduction in mitral valve regurgitation (MVR) after GDMT titration and change in EF based on provider type. Patients were selected based on an electronic medical record report of consecutive patients seen in a HF clinic from 1/1/2021 to present day.

Results:
Eighty-seven patients were included in the study with a mean age of 61 years old, 64.4% of patients were male, and 58.6% were white. Following GDMT titration, 90.8% of patients had an improvement in EF. Mean total time to GDMT titration was 146.6 days (<6 months). EF improvements of 19.5%, 19.1%, 21.0%, and 17.3% were achieved in the <3 months, 3–6-month, 6-9 month, and >9 months groups, respectively (P = 0.823). No significant difference was found in reduction of MVR post-titration (P = 0.523) or in change in EF by provider type (P = 0.703) among the various titration groups. Fifty-three patients had a degree of MVR at baseline and 73.6% (39/53) had a reduction in MVR after titration.

Conclusions:
This study confirms that GDMT titration improves EF, however improvement in EF is not impacted by how quickly a patient reaches GDMT. The data, although hypothesis generating, can be used to support prioritizing faster and slower GDMT titration, based on patient specific factors, as both titration velocities resulted in similar improvements in EF.

Optimization of Automated Dispensing Technology in a Community Hospital

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UAN: 0048-0000-23-120-L04-P

Learning Objectives:

1. Identify areas for improvement in automated dispensing technology.
2. Develop a pharmacist driven stewardship team for optimization of automated dispensing technology.

Purpose:

Automated dispensing cabinets (ADC) are used in virtually every hospital in the United States. While they have aided in the efficiency of delivering medications to patients, there is still room to improve these machines. Our hospital has identified a high number of medications being filled in the pharmacy and then being sent up to the floors rather than being dispensed from the ADCs. Through improvement of these cabinets, there will be less chances of medications being lost in transit, along with less waste and less stress being put on the pharmacy department.

Methods:

Data was collected and analyzed over a one-month time period for two units in the hospital that assessed how many medications were dispensed from the ADCs, how many medications were filled in the pharmacy and tubed up to the floors, and how often nurses requested medications be sent from the pharmacy up to the floors. Other data that was assessed was the number of times certain medications were dispensed from each cabinet, and how often a medication had reached a stock of zero in the cabinet. After analyzing the data, ten medications were chosen to either increase or decrease their par levels in the ADC or add or remove from the cabinets. After this intervention took place, the same data was collected for a one-month period. The primary outcome was the ratio of medications vended from the ADCs to medications filled in the pharmacy.

Results:

The initial total number of vends from the ADCs for the two units for one month was 12,249 and the total number of medications filled in the pharmacy for those units for that month was 3,365, leading to a Vend-to-Fill Ratio of 3.64. After the interventions were made, the following month found a total number of vends for the two units was 15,650 and the total number of medications filled in the pharmacy for the month was 3,777, leading to a Vend-to-Fill Ratio of 4.14. This represents an increase in the Vend-to-Fill ratio of about 14%. The number of tubes sent from the pharmacy to the floors was a secondary outcome, and decreased from 9,385 to 8,939, representing a decrease of about 5%.

Conclusions:

Implementation of an Automated Dispensing Cabinet stewardship team led by pharmacists resulted in an increased number of medications being dispensed from the cabinets and an increase in the Vend-to-Fill Ratio.

Effect of Early Vasopressin Administration in Hemorrhagic Shock

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UAN: 0048-0000-23-121-L01-P

Learning Objectives:

1. Review the current role of vasopressors for trauma patients in hemorrhagic shock and evidence for early administration of vasopressin.
2. Analyze the study design, methods, and results of this study that evaluates the safety and efficacy of early administration of vasopressin in trauma patients with hemorrhagic shock.
3. Discuss the outcomes of the study and apply them to current practice.

Purpose:
Standard management of hemorrhagic shock includes controlling the bleed and replacing blood products, but in cases of refractory shock, vasopressor therapy may be needed to maintain perfusion. Recent studies have shown potential benefits with early vasopressin use, but there is limited evidence on the ideal vasopressor regimen and the timing of administration. This study aims to evaluate the safety and efficacy of early administration of vasopressin in trauma patients with hemorrhagic shock.

Methods:
This retrospective cohort study was performed at a single 511-bed level 1 trauma center. The primary outcome was 28-day alive and vasopressor-free days from admission. Secondary outcomes included amount of blood product administration, 28-day alive and mechanical ventilation-free days, and ICU and hospital length of stay. Safety outcomes included incidence of renal replacement therapy, venous thromboembolism, and fluid overload.

Results:
Overall, 46 patients were included in the study, with 10 (22%) in the vasopressin group and 36 (78%) in the norepinephrine group. Baseline characteristics were well balanced between the groups with the majority of patients being male (n=34, 63%), with blunt injuries (n=29, 63%), and a median injury severity score of 26 (IQR: 17.0 -34.0). There was no difference for the primary outcome between the vasopressin and norepinephrine group [24.5 (IQR: 19.9 -26.1) vs 26 days (IQR: 21 -26.7); p=0.4829]. No statistically significant differences were identified in the secondary outcomes or adverse events.

Conclusions:
Early administration of vasopressin was not associated with a significant difference in the primary outcome compared to the norepinephrine group. Future studies with large sample sizes of patients are needed to determine the effect of early vasopressin administration.

Evaluating the Safety of Famotidine Use in Neonates

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UAN: 0048-0000-23-122-L05-P

Learning Objectives:

1. Understand the differences between neonatal and adult gastrointestinal tracts
2. Review current literature and guideline recommendations for H2RA use in neonates
3. Discuss methods and results of the project

Purpose:

The gastrointestinal tract of a neonate is vastly different from that of older children and adults. Differences exist in gastric acidity, lower esophageal sphincter pressure, motility, microbiota, and epithelial permeability. Despite these differences, histamine-2 receptor antagonists (H2RAs) are still among the most commonly prescribed medications in the neonatal intensive care unit (NICU). The evidence for their use is lacking and neonatal trials with H2RAs have not demonstrated improvement in gastroesophageal reflux symptoms or reductions in stress ulcer development. These trials, however, have shown adverse effects, such as infections, necrotizing enterocolitis (NEC), and mortality. Therefore, the purpose of this study is to evaluate the safety of famotidine use in preterm neonates in the NICU.

Methods:

This was a single-center, historical cohort study of preterm neonates admitted to the NICU at Ascension St. John Hospital between January 1, 2015 and September 30, 2022 for a minimum of seven days. Neonates were excluded if they had a major congenital malformation, genetic diagnosis, were born from mothers with trans-placental infection, or were transferred to another facility. Data points collected included: maternal history, neonatal demographics (for example: gestational age, birth-weight, one- and five-minute Apgar scores), method of delivery, famotidine use, antibiotic use, occurrence of infection, NICU length of stay, and mortality. The primary outcome was to evaluate the association between famotidine use and composite infection. Composite infection was defined as any one of the following: bacteremia, culture-negative sepsis, pneumonia, and/or NEC that occur after day seven of life. Secondary outcomes included, individual infections, mortality and length of stay.

Results:

Data collection is complete, analysis is underway. Results will be presented at the Ohio Pharmacy Residency Conference.

Conclusions:

To be presented at the Ohio Pharmacy Residency Conference.

Implementation of the Khorana Score for venous thromboembolism prophylaxis in ambulatory oncology patients at a community cancer center

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UAN: 0048-0000-23-123-L01-P

Learning Objectives:

1. Identify ambulatory cancer patients who would be candidates for prophylactic anticoagulation using the Khorana Score.
2. Review guideline recommendations for prophylactic anticoagulation for ambulatory cancer patients.

Purpose:

Cancer patients have an increased venous thromboembolism (VTE) risk, which is highest within the first six months after diagnosis. VTE's may be associated with treatment interruptions and significant morbidity and/or mortality. Current guidelines suggest risk stratification scores such as the Khorana score to identify candidates for prophylactic anticoagulation. These scores are not routinely applied to ambulatory cancer patients at our facility. This study was designed to evaluate utility and implementation of the Khorana risk score in ambulatory cancer patients at a community cancer center.

Methods:

This study was approved by the institutional review board. This retrospective chart review was conducted to identify cancer patients diagnosed with an acute blood clot after treatment initiation in the ambulatory setting or within 48 hours of an inpatient admission from July 1, 2021 to June 30, 2022. Patients 18 years or older, with solid tumors were included. Patients with hematologic malignancies, benign hematologic abnormalities, history of thrombosis, recent surgery, therapeutic anticoagulation, and those who are pregnant were excluded. If eligible for inclusion, the following data points were collected and assessed: demographics, cancer type, cancer diagnosis date, stage of cancer, chemotherapy regimen, antiplatelet use, indwelling catheter, functional status, use of red cell growth factors, and prechemotherapy platelet count, hemoglobin, and leukocyte count. The primary outcome was to quantify the number of patients who are high risk per the Khorana score.

Results:

Final results will be presented at the Ohio Pharmacy Resident Conference.

Conclusion:

Conclusions will be presented at the Ohio Pharmacy Resident Conference.

Evaluation of Gender-Affirming Care Community Pharmacy Experiences of Transgender and Gender Non-Conforming Patients within an LGBTQ+ Community-Based Health System

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UAN: 0048-0000-23-124-L04-P

Learning Objectives:

1. Describe current healthcare barriers expressed within gender diverse populations.
2. Recognize the implications of these barriers on engagement within the health system and the community pharmacy setting.
3. Understand how gender diverse health care services and inclusive care environments impacts these patients' perceptions and behaviors to community pharmacy care.

Purpose:

Equitas Health is a community-based health system whose mission is to provide care for all with a focus on the lesbian, gay, bisexual, and queer/questioning (LGBTQ+) community. It serves as a point of access for transgender and other gender diverse groups in need of gender-affirming care (GAC). While interest in researching this population has increased in recent years, this patient population remain underrepresented in literature. Much of what is published discusses the many persistent barriers which limit care access and their implications for these patients. What remains unknown is how the provision of GAC and gender inclusive environments impact these patients' perceptions and behaviors within the health system. The purpose of this study is to investigate how these factors are influenced within the community pharmacy setting when gender diverse services become more readily accessible.

Methods:

This project is a cross-sectional multisite paired response survey conducted at four Equitas Health community pharmacy locationsin Ohio; two in Columbus, one in Cincinnati, one in Dayton. Both electronic and hardcopy versions of the survey were available. Survey period was for 30 days (February 27th – March 28th). Patients greater than 18 years of age who receive at least one prescription from an Equitas Health pharmacy and self-identify as transgender or other gender diverse group or whose current identity is not congruent with their sex assigned at birth were included for analysis. Individuals whose gender identity matches with their sex assigned at birth (cisgender), incomplete submissions, or submissions outside the 30-day survey period were excluded. Participants were recruited at the point of sale and asked to answer a series of questions on a 5-point Likert-scale twice, once for their community pharmacy experience at Equitas Health and again for any pharmacy experiences outside the organization. Cohen's Method was used to estimate sample size and paired responses were analyzed through the Wilcoxon-Signed Rank Test.

Results:

Data analysis is underway and will be presented at the Ohio Pharmacy Residency Conference

Conclusions:

Will be presented at the Ohio Pharmacy Residency Conference

A Retrospective, Chart Review Comparing the Efficacy and Safety of Tenecteplase versus Alteplase for Acute Ischemic Stroke

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UAN: 0048-0000-23-125-L01-P

Learning Objectives:

1. Review current literature for tenecteplase in acute ischemic stroke
2. Compare outcomes for both tenecteplase and alteplase
3. Determine if there are any clinically significant differences between the two drugs

Purpose:
The standard of care for acute ischemic stroke globally has been intravenous thrombolysis with an alteplase bolus followed by an infusion. Recent literature has prompted the transition to using tenecteplase as the new standard of care. This study aims to compare alteplase and tenecteplase outcomes following its implementation.

Methods:
In this multicenter, retrospective chart review patients were enrolled from 4 southwest Ohio hospitals. Patients were eligible for inclusion if they received either alteplase or tenecteplase for treatment of acute ischemic stroke. Data for alteplase patients was gathered from January 1st, 2022, through July 16th when the switch was made to tenecteplase. Tenecteplase data was gathered from July 17th through December 31st of 2022. Eligible patients were assigned to groups based on the thrombolytic they received. Thrombolytics administered were either alteplase 0.9 mg/kg with a maximum of 90 mg given as 0.09 mg/kg bolus with the remaining 0.81 mg/kg run as a 1-hour infusion or tenecteplase 0.25 mg/kg with a maximum dose of 25 mg given via intravenous push. The primary outcome was the proportion of patients who returned to baseline before stroke, measured using disposition at discharge as a surrogate measure for modified Rankin Scale (mRS) score.

Results:
Data was collected on 126 patients who received a thrombolytic at 1 of 4 study sites. Baseline demographic and clinical characteristics were similar between the alteplase and tenecteplase groups. The overall median age was 69 years old (IQR 59-77); 52 (41%) of the patients were female and 74 (59%) were male. Data on race revealed that 98 patients were white (78%), 23 black (18%), and 4 (~3%) were of another race. For the primary outcome, 34 (48%) of the alteplase patients and 23 (42%) of the tenecteplase patients were discharged to their prior disposition. There was no significant difference in adverse events between the alteplase and tenecteplase groups.

Conclusions:
Retrospective analysis revealed no significant differences in the incidence rate of adverse events for tenecteplase versus alteplase. Slight differences did exist between the groups in terms of acuity and age which may have skewed the primary outcome to slightly favor alteplase.

Outcomes of fluid resuscitation in the emergency department for heart failure patients with septic shock

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UAN: 0048-0000-23-126-L01-P

Learning Objectives:

1. Review sepsis guideline recommendations for fluid administration.
2. Discuss literature regarding fluid administration for septic patients predisposed to fluid overload.

Purpose:
Surviving Sepsis Campaign guidelines suggest ≥ 30 mL/kg of intravenous crystalloids within the first three hours of resuscitation for patients with sepsis induced hypoperfusion or septic shock. Previous literature showed mechanical ventilation was associated with increased mortality for patients with severe sepsis or septic shock. Therefore, conservative fluid resuscitation in congestive heart failure (CHF) patients predisposed to fluid overload seems reasonable to prevent respiratory compromise. The purpose of this study was to evaluate the outcomes of patients with CHF in septic shock who received 30 mL/kg of fluid or more within three hours of sepsis identification.

Methods:
This was a retrospective study of adult patients with CHF presenting to the emergency department in septic shock between January 1, 2020 and July 31, 2022. The primary outcome was mechanical ventilation requirement within 24 hours for patients who received ≥ 30mL/kg (fluid challenge) versus those who received < 30mL/kg (conservative fluid management) within three hours. Secondary outcomes included in-hospital mortality, intensive care unit (ICU) length of stay, vasopressor use within 24 hours, and subgroup analyses of patients with reduced ejection fraction or renal impairment at baseline.

Results:
Among the 156 patients in this study, 60 received a fluid challenge and 96 received conservative fluid management. There was no difference for requirement of mechanical ventilation within 24 hours of sepsis identification between the fluid challenge versus conservative fluid management groups (30% vs 27%; P = 0.694). There was no significant difference in secondary outcomes or subgroup analyses.

Conclusions:
Administration of a fluid challenge for patients with CHF in septic shock was not associated with an increased risk of mechanical ventilation. This was a small, retrospective study and larger studies are needed to further explore the outcomes of administering fluids to CHF patients in septic shock.

Comparison of Ceftazidime-Avibactam and Ceftolozane-Tazobactam for Ventilator-Associated Pneumonia Due To *Pseudomonas aeruginosa* With Difficult-To-Treat (DTR) Resistance

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UAN: 0048-0000-23-127-L01-P

Learning Objectives:

1. Recognize the importance of *Pseudomonas aeruginosa* as a serious pathogen among hospitalized patients with ventilator-associated pneumonia.
2. Discuss strategies for treatment selection in patients with difficult-to-treat resistant *Pseudomonas aeruginosa.*

Purpose:

Pseudomonas aeruginosa remains a serious health concern because of its increasing prevalence as a resistant microorganism. Ventilator-associated pneumonia increases the risk for developing resistant *P. aeruginosa* infections, which are becoming progressively harder to treat. Current guidelines recommend that definitive therapy for difficult-to-treat resistant (DTR)-*P. aeruginosa* be guided by antimicrobial susceptibilities, with ceftolozane-tazobactam, ceftazidime-avibactam, and imipenem-cilastatin-relebactam being the preferred options. Resistance of DTR-*P. aeruginosa* isolates to the newer β-lactam-β-lactamase inhibitor agents remains an ongoing concern. This research study aimed to further characterize comparative clinical outcomes between ceftolozane-tazobactam and ceftazidime-avibactam to help guide treatment selection.

Methods:

This was a retrospective cohort study including patients from January 1st, 2018 to July 31st, 2022. Patients were included if they were ≥ 18 years old, admitted to the Detroit Medical Center, had a diagnosis of VAP, a respiratory culture with DTR-*P. aeruginosa,* and received ≥ 72 hours of treatment with ceftazidime-avibactam or ceftolozane-tazobactam. The primary outcome was clinical failure at the end of therapy. The secondary outcomes included in-hospital mortality, 30-day all-cause mortality from collection of the index culture, isolation of a pathogen resistant to either study drug within 90 days following treatment, 30-day recurrence of VAP with the same organism, and adverse drug events (*C. difficile* infection within 30-days post treatment, rash).

Results:

A total of 112 patients will be included. Categorical and continuous variables will be evaluated with the appropriate statistical tests. Factors that may contribute to mortality will be identified with a multivariate logistic regression, which will be based on bivariate comparisons with a P-value < 0.2. The final results of this study will be presented at the Ohio Pharmacy Residency Conference.

Conclusions:

The results of this study will further characterize the comparative clinical outcomes between ceftazidime-avibactam and ceftolozane-tazobactam for the treatment of DTR-*P. aeruginosa*. Final conclusions will be presented at the Ohio Pharmacy Residency Conference.

Evaluation of interdisciplinary collaboration between pharmacists and other providers for patients with recently started or altered doses of antidepressants and/or antipsychotics.

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UAN: 0048-0000-23-128-L01-P

Learning Objectives:

1. Explain the novel workflow of the interdisciplinary collaboration in the management of patients with recently started or altered doses of antidepressants and/or antipsychotics.
2. Describe the roles and responsibilities of pharmacists and other healthcare providers in the interdisciplinary team.
3. Identify the potential benefits of interdisciplinary collaboration in improving patient outcomes, including medication safety, adherence, and overall clinical outcomes.

Purpose:

This research aims to evaluate the impact of the collaborative practice model between pharmacists and other providers with an established workflow designed to improve adherence to antidepressant medications and decrease of depressive symptoms through early interventions.

Methods:

This study was approved by the Institutional Review Board of Marshall University. The database contained approximately two years of data since the service started. The study's inclusion criteria included patients newly diagnosed with depression and those with persistent long-term depressive order symptoms who were referred by the patient's primary care provider within Holzer Health System. The pharmacist evaluated these patients and assessed their current anti-depression treatment regimen. Patients received a call from the pharmacist within the first 14 days of starting an antidepressant or antipsychotic therapy. Data from the calls were recorded, and the pharmacist can recommend additions, or changes of medication therapy for their patients; adequately monitor patients for side effects of their medications; assess and counsel on medication adherence and make any other recommendations to providers. PHQ-9 scores were used to evaluate the improvement of depressive symptoms over time. The primary outcome evaluated for the collaborative workflow design in this study is the change in depressive symptoms before and after the intervention. The secondary outcomes were assessed to evaluate adherence to medications with the recommendation accepted by providers.

Results:

The collaborative practice between pharmacists and other healthcare providers proven to be effective in reducing depression symptoms through early interventions, as revealed by the study's results. Out of the 143 patients involved, 106 showed improvements in their PHQ-9 scores after receiving interventions, and 83 patients remained adherents to their antidepression/antipsychotic medication. The approval of pharmacist recommendations by providers has shown a significant impact on antidepressant therapy adherence, PHQ-9 scores, and the gradual reduction of depressive symptoms.

Conclusions:

The results of the study have shown to improve adherence to antidepressant medications and decrease depressive symptoms over time for patients who received service from pharmacists. Based on the results, the novel service workflow has shown the impact of the collaboration practice between pharmacist and other providers to reduce depression symptoms through early interventions.

Impact of Ambulatory Care Pharmacist on Hemoglobin A1c Values Among Patients with Diabetes in a Primary Care Clinic Compared to Usual Care

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UAN: 0048-0000-23-129-L01-P

Learning Objectives:

1. Discuss the outcomes associated with uncontrolled type 2 diabetes
2. Review the literature on ambulatory care pharmacist interventions in type 2 diabetes management
3. Describe the impact of an ambulatory care pharmacist on reduction in hemoglobin A1c in patients with type 2 diabetes

Purpose:
Literature has shown the positive impact of ambulatory care pharmacists on diabetes management, yet additional research on clinical outcomes compared to traditional care models is warranted. The objective of this study is to evaluate the impact of an ambulatory care pharmacist on glycemic control over two years compared to patients who received usual care.

Methods:
This retrospective cohort study matched patients with a baseline HgbA1c ≥ 8% managed by the ambulatory care pharmacist to patients who received usual care. The primary outcome was the mean change in hemoglobin A1c (HgbA1c) over two years. The secondary outcomes were to evaluate the difference in (1) the proportion of patients achieving HgbA1c <8%, (2) the proportion of patients achieving blood pressure <130/80 mmHg, (3) mean LDL, (4) the proportion of patients prescribed SGLT2i, GLP-1a, and sulfonylureas, and (4) hypoglycemia after two years.

Results:
Data for 180 patients was analyzed over two years. The mean HgbA1c was 10% at baseline vs 8.2% after two years (adjusted mean change -1.92) among pharmacist-managed patients, compared to 9.9% vs 9% respectively for usual care patients (adjusted mean change -0.98) ($p = 0.004$). 53.5% of pharmacist-managed patients achieved HgbA1c < 8% compared with 34.2% of usual care patients ($p = 0.014$). There were no statistically significant differences in proportion of patients at goal blood pressure, mean LDL, or hypoglycemia between the two groups. After two years, 18.3% of pharmacist-managed and 5.8% of usual care patients were on an SGLT-2i ($p = 0.008$), and 46.7% of pharmacist-managed and 9.2% of usual care patients were on a GLP-1a ($p < 0.001$). No difference was found in sulfonylurea utilization.

Conclusions:
Patients with uncontrolled type 2 diabetes who received care from an ambulatory care pharmacist had an HgbA1c reduction nearly twice that of matched controls provided usual care.

Pharmacist-led management of rheumatoidarthritis in a federally qualified health center

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Learning Objectives:

1. Discuss the implementation process of a pharmacist-led rheumatoid arthritis consult agreement
2. Identify the need for pharmacist-led management of rheumatoid arthritis

Purpose:

Swift diagnosis and treatment of rheumatoid arthritis (RA) is crucial for better patient outcomes. Timely initiation of disease-modifying anti-rheumatic drugs (DMARDs) can significantly preserve joint function, reduce inflammation, and minimize disease activity. Delayed access to rheumatology specialists can lead to poorer outcomes. To tackle this issue, the American College of Rheumatology (ACR) proposes increasing the number of healthcare professionals trained to manage and treat RA, including pharmacists. Given recent changes in the scope of practice for pharmacists to prescribe medications, pharmacists can provide an avenue for patients to access early DMARD therapy. This study aims to evaluate the outcomes of a pharmacist-led approach to treat RA.

Methods:

This program has been developed based on three key outcome categories: implementation, patient visits, and quality improvement strategies. The implementation phase involves several steps, such as conducting an in-person Continuing Education program for the providers at AxessPointe and drafting a collaborative practice agreement for review and approval by the medical director. In the patient visit category, we have developed a standardized tool that enables pharmacists to order specific labs and utilize clinical tools to assess medication safety and efficacy as per the collaborative practice agreement. Lastly, the quality improvement component focuses on evaluating key outcomes, such as the frequency of pharmacist visits, effectiveness of interventions, and the rate of patient remission or low disease activity. These outcomes are critical for ensuring patient satisfaction and driving overall program enhancement.

Results:

Currently, we are awaiting final approval of the collaborative practice agreement before initiating this service. Implementation is planned to begin June of 2023, with evaluation of the program to occur the following year.

Conclusions:

N/A

Determining the Impact of Empagliflozin Therapy on Outcomes for Patients with Heart Failure

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UAN: 0048-0000-23-131-L01-P

Learning Objectives:

1. Discuss the background of the sodium glucose transporter (SGLT-2) indication for heart failure (HF) – its mechanism and previous studies supporting its inclusion into the guidelines
2. Explain the purpose of the research project and the need for its completion
3. Discuss the methods, results, and conclusions of the research

Purpose:

The purpose of the study is to evaluate the safety and efficacy of empagliflozin for heart failure patients admitted to Mercy Health – Fairfield Hospital. Empagliflozin, an FDA approved drug for heart failure, was recently added to the hospital's formulary on 6/7/22. This study seeks to determine if patients at our hospital show benefit from the addition of empagliflozin to their medication regimen when indicated.

Methods:

This study is a retrospective chart review of all patients who are admitted for a heart failure indication and discharged with or without being prescribed empagliflozin. The study population includes all patients admitted to Mercy Health – Fairfield Hospital between March 1, 2022 and January 7, 2023. The primary outcome is the hospital readmission rate among heart failure patients discharged on empagliflozin and heart failure patients not discharged on empagliflozin. Secondary outcomes are include total number of hospitalizations during the study period, death from cardiovascular (CV) causes, and days to readmission during the study period. Safety outcomes are: decline in renal function as defined as the rate of decline in estimated glomerular function rate (eGFR) over the course of the study and the rate of urinary tract infections (UTI) as defined as positive urine culture results with initiation of antimicrobial therapy. A statistical significance level is set to 95% for all comparison ($P<0.05$).

Results:

A total of 289 patients were screened: 29 in the treatment group and 34 in the control group. Baseline characteristics were similar among groups, with notable exceptions in atrial fibrillation (treatment: 9, control: 23; $p = 0.0054$) and admission pro-BNP (treatment: 2,967, control: 9,358; $p = 0.0017$). The primary outcome of readmission rate for heart failure exacerbation favored empagliflozin (treatment: 2, control: 6; $P = 0.2617$), but was not statistically significant. Likewise, a Kaplan Meier Survival Analysis for time to heart failure readmission showed no statistical significance ($p = 0.231471$). Other secondary outcomes were not significant: total hospitalizations (69 in treatment, 79 in control; $p = 0.89$), CV deaths (2 in each group, $p = 1.00$), UTI occurrence (2 in each group, $p = 1.00$), eGFR decline ($p = 0.7279$).

Conclusions:

Based on the small sample size, short research window, and lack of statistical significance, this study is exploratory in nature. This study did reveal a potential underutilization of empagliflozin for heart failure patients, so increasing the prescribing of empagliflozin when indicated could lead to further research on this topic. Future studies could also account for outpatient prescribing of empagliflozin and increase the scope of the study to include all hospitals in the Bon Secours Mercy Health system.

Evaluation of an Antimicrobial Stewardship Intervention for Non-Severe Community-Acquired Pneumonia

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UAN: 0048-0000-23-132-L01-P

Learning Objectives:

1. Explain the consequences of excessive duration of antibiotic therapy in non-severe community-acquired pneumonia (CAP)
2. Recognize appropriate use of broad-spectrum antibiotics in the treatment of non-severe CAP

Purpose:

Community-acquired pneumonia (CAP) requiring hospitalization is a leading contributor to inpatient antibiotic overuse. To address this, multiple performance measures associated with CAP treatment have been developed at the hospital, state, and national level, including appropriate duration of antibiotic therapy and use of broad-spectrum antibiotics. The Michigan Hospital Medicine Safety Consortium (HMS) provides guidance and reports on various measures, including non-severe CAP. Based on recent reports from HMS, many institutions have opportunities for improvement. The purpose of this study was to assess the impact of provider-specific antimicrobial stewardship report cards on improving adherence to HMS treatment guidelines for non-severe CAP at Corewell Health Beaumont Hospital Troy.

Methods:

This single-center, retrospective pre-post study compared the treatment of adult patients admitted with non-severe CAP before (May 2021 through April 2022) and after (October 2022 through January 2023) an antimicrobial stewardship intervention consisting of provider-specific report cards which were delivered to attending internal medicine providers who treated multiple patients with CAP during the pre-intervention period. Report cards consisted of feedback on the provider's duration and choice of antibiotic therapy compared to their peers and to goals set by HMS performance measures. The primary objective of the study was to assess the impact of an antimicrobial stewardship intervention on prescribed duration of antibiotic therapy for the treatment of non-severe CAP. Secondary objectives of the study were to evaluate: (1) use of unnecessary broad-spectrum antibiotics (based on HMS recommendations); (2) inpatient, outpatient, and overall duration of prescribed therapy; and (3) documentation of planned duration of antibiotic therapy by provider specialty.

Results:

To be presented at the 2023 Ohio Pharmacy Resident Conference.

Conclusions:

To be presented at the 2023 Ohio Pharmacy Resident Conference.

Implementation of a Spanish-speaking team and its implications on patient care within a pharmacist-driven Ambulatory Care clinic integrated in a pharmacy school

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UAN: 0048-0000-23-133-L04-P

Learning Objectives:

1. Recognize and identify differences in treatment approaches when addressing patients of Spanish-speaking origin
2. Identify best practices and resources needed to train native and non-native Spanish-speaking individuals for patient interactions with limited English proficiency populations within an ambulatory care clinic
3. Describe knowledge and skills required to effectively provide care to Spanish-speaking patients and increase provider participation in diversity and inclusion

Purpose:

To implement and examine the impact of training Spanish-speaking individuals to provide care in a pharmacist-driven ambulatory care clinic integrated within a college of pharmacy. The study aimed to identify opportunities to increase provider participation in diversity and inclusion with patient care, identify best practices and resources needed to train native and non-native speakers for interacting, and serve those with limited English proficiency, and assess satisfaction rates of services and training.

Methods:

Pre/post-surveys were conducted at a College of Pharmacy to assess interest in designing more inclusive material among those with differing Spanish-speaking abilities. Learning opportunities were provided to students to help teach cultural beliefs and differences in treatment. Post-surveys were performed after patient interactions to evaluate the satisfaction of both learners and patients regarding their training and encounters. Data collection includes satisfaction with interpreting services, comprehension of health information, suggestions for service improvement, and terminology clarification.

Results:

A total of 8 students were identified as interested in serving with 3 of those being able to speak Spanish, and only one being a native Spanish-speaker. Educational meetings have covered topics such as proper utilization of interpreters, effective communication skills, how to conduct an appointment, commonly used OTC products, medical terminology, and interpretation of buzz words related to ONU HealthWise services. The program has served a total of 5 patients and recruitment of additional patients is ongoing. The project continues with results being presented in May at the Ohio Residency Conference.

Conclusions:

Conclusions will be presented at the Ohio Pharmacy Residency Conference in May 2023.

Pharmacist – Driven – Protocol: Early utilization of phenobarbital for alcohol withdrawal syndrome in a community hospital emergency department

Ginny Rhoades, PharmD, BCPS – Southwest General
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Learning Objectives:

1. Discuss the utility of phenobarbital for alcohol withdrawal syndrome
2. Review current recommendations, literature, and appropriate patient populations for phenobarbital initiation

Purpose:

Phenobarbital is an attractive alternative agent to benzodiazepines for AWS due to its rapid onset, long half-life, and measurable serum level that correlates to clinical effect. In light of the current lorazepam shortage, clinicians must take advantage of other alcohol withdrawal therapies, but lack of familiarity and experience with phenobarbital limits current utilization despite encouraging clinical trials. The purpose of this research is to compare previous patient cases of AWS presenting to the ED, who were treated with benzodiazepines to a new standard of care in the ED.

Methods:

This is a bidirectional cohort study to determine whether implementation of a pharmacy driven phenobarbital protocol decreases hospital admissions in patients presenting to the ED with AWS. Patients deemed appropriate for phenobarbital will be placed in an appropriate phenobarbital for alcohol withdrawal syndrome protocol pathway based on initial CIWA-Ar score. Patients must be at least eighteen years old and present to the ED with acute alcohol intoxication or in alcohol withdrawal. Patients will be excluded for age less than 18 years, hepatic failure, or pregnancy. Patients who presented to the ED between October 1, 2021 - February 28, 2022 will be assigned to the retrospective cohort. Patients who presented to the ED between October 1, 2022 – February 28, 2023 will be assigned to the prospective cohort. Secondary outcomes will evaluate ED length of stay, hospital length of stay, cumulative CIWA-Ar scores, need for intubation, rate of transfer to a higher level of care, return to the ED within 72 hours, and dexmedetomidine use. A convenience sample will be utilized for the observational cohort study. Chi-squared will be used to analyze the primary outcome. Chi-squared and t-test will be utilized to analyze secondary outcomes.

Results:

To be presented at Ohio Pharmacy Residency Conference.

Conclusions:

To be presented at Ohio Pharmacy Residency Conference.

Mitigation of immunization disparities at a federally health-qualified center

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UAN: 0048-0000-23-135-L06-P

Learning Objectives:

1. Review the impact of the coronavirus (COVID-19) pandemic and recent viral outbreaks
2. Discuss the social disparities of health related to immunization access
3. Identify the significance of federally health qualified centers (FQHCs) to reduce inequities in preventative health

Purpose:

The coronavirus (COVID-19) pandemic has exacerbated many pre-existing health disparities and inequities, specifically regarding racial and ethnic disparities. Despite being highly effective and safe in reducing infection, severity of disease, hospitalizations, and deaths, immunizations remain unavailable in certain communities like Cleveland for a variety of reasons. Thus, it remains critical to ensure that access to these immunizations is equitably distributed within various communities. Federally health qualified centers (FHQCs) consist of a network of safety net providers designed to serve an underserved population or area. The purpose of this study is to determine the magnitude of reach FQHCs have on expanding access to immunizations.

Methods:

A retrospective chart review of all immunizations administered between January 2022 to December 2022 across all five of the Centers' locations (Uptown, East, Gordon Square, West, and Southwest) was conducted. Descriptive analysis of the data is ongoing and will aim to assess correlations between demographics related to the underserved populations and immunizations that were provided.

Results:

Data review and statistical analysis are ongoing. Discussion of the results will be presented at the Ohio Pharmacy Residency Conference 2023.

Conclusions:

It is anticipated that the results of this study will demonstrate how FQHCs like the Centers for Families and Children facilitate expanding access to a variety of immunizations within “hard-to-reach" communities.

Oral Anticoagulant Therapy Upon Discharge From the University of Toledo Medical Center: An Analysis of Guideline Compliance

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UAN: 0048-0000-23-136-L01-P

Learning Objectives:

1. Review the role of oral anticoagulants in outpatient management of thrombotic disorders.
2. Describe current prescribing patterns of oral anticoagulants upon hospital discharge.
3. Discuss existing barriers to appropriate anticoagulant prescribing and how these barriers can be addressed.

Purpose:

The purpose of this study is to describe the prescribing patterns of oral anticoagulants at the University of Toledo Medical Center (UTMC) upon patient discharge and to evaluate compliance with current guidelines.

Methods:

This study was a single-center retrospective review including patients who were discharged from UTMC with a prescription for a DOAC or warfarin with a prescription written date between 7/1/21 to 6/30/22. The prescription must have been filled through UTMC's discharge prescription delivery program. Patient information was collected and evaluated to determine the primary outcome of compliance with guideline directed medical therapy (GDMT) for atrial fibrillation (Afib) and venous thromboembolism (VTE). Secondary outcomes included social determinants of health that affected prescribing patterns and percentage of patients who were referred to UTMC's outpatient anticoagulation clinic.

Results:

One hundred ninety-six patients discharged with a prescription for a DOAC or warfarin were included in this study. Fifty-five prescriptions (28%) were prescribed inappropriately, with 3%for an inappropriate indication, 17% for an inappropriate drug, 4% for an inappropriate dose, and 5% for an inappropriate duration. Of the eighty-eight prescriptions for VTE prophylaxis, 39% were prescribed for an inappropriate drug. A DOAC or warfarin was inappropriately prescribed among Black or African American patients 33.3% of the time, among white patients 23.9% of the time, and among other races 71.4% of the time. A DOAC or warfarin was inappropriately prescribed among patients using commercial insurance 25.2% of the time, among patients using Medicaid 48.4% of the time, among patients using Medicare 17.2% of the time, and among patients not using insurance 50% of the time.

Conclusions:

DOACs in this study were commonly prescribed for non-FDA approved indications not supported by current guidelines. Limited documentation of intended therapy duration is also evident, which may contribute to inappropriate continuation or discontinue or therapy at follow-up and transitions of care. With these study results UTMC prescribers may be able to examine current prescribing practices as well as implement features of the EMR to improve documentation and adherence to therapy guidelines. Pharmacists can also play a major role in monitoring and adjusting anticoagulants appropriately.

Impact of pharmacist education in topics specific to the special care nursery (SCN)

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Learning Objectives:

1. Discuss the importance of education for pharmacists in SCN specific topics to ensure confidence and decrease chances of medication errors.
2. Describe the potential roles a pharmacist can play in a SCN specific unit.

Purpose:

Roles of pharmacists in specialized care units have continued to expand over time. However, the role of a pharmacist in a SCN has yet to be fully established and discussed in literature. The purpose of this study is to provide education to pharmacists in pediatric disease states specific to a SCN setting and evaluate the overall confidence of a pharmacist after education is provided utilizing survey based results. The hope would be to decrease the risk of medication errors and establish unit based pharmacists in this setting.

Methods:

This quality improvement study will provide education to pharmacists to ensure they are comfortable reviewing orders and caring for patients in the SCN population. Pharmacists that participate in education will be asked to complete a pre and post survey to evaluate their knowledge and confidence in the material. Pharmacists included will be those that work in the inpatient pharmacy setting. No exclusion criteria have been identified. Data will be collected through survey responses. A survey will be provided to pharmacists who volunteer to participate in educational opportunities specific to SCN topics. The questionnaire will evaluate knowledge along with self-reflection on how comfortable the pharmacist feels with SCN topics before and after the educational opportunities.

Results:

Data analysis is on-going and will be presented at 2023 Ohio Pharmacy Resident Conference

Conclusions:

To be presented at 2023 Ohio Pharmacy Resident Conference

Average Catecholamine Rates During Enteral Nutrition in Critically Ill Patients: A Retrospective Cohort Study

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Learning Objectives:

1. Discuss the importance of identifying safe catecholamine vasopressor rates at which to start enteral nutrition in critically ill patients.
2. Describe how tolerance to enteral nutrition can be monitored in patients on vasopressors.

Purpose:
The benefits of enteral nutrition in critically ill patients are well established. There is no consensus regarding the optimal dose to begin enteral nutrition in patients on vasopressors and there are concerns for intestinal injury due to hypoperfusion from vasopressor use. However, it is not well defined what specific doses of vasopressors could lead to this injury, given the overall incidence is low.

Methods:
This retrospective cohort study was completed on adult patients who had an order for a catecholamine vasopressor and enteral nutrition admitted to one of Cleveland Clinic Akron General's intensive care units between January 1, 2018 and June 30, 2022. The primary outcome was to determine the average catecholamine vasopressor rates at the start time of enteral nutrition. The secondary outcome was assessment of adverse effects of enteral nutrition on catecholamine vasopressors. A subgroup analysis compared adverse events and tolerability between patients on low versus high norepinephrine requirements and between patients on one versus multiple vasopressors.

Results:
A total of 230 patients were included. The median age was 66 [56-75], the median APACHE III score was 65 [45-89]. The median norepinephrine rate in mcg/kg/minute in norepinephrine equivalents at the initiation of tube feeds was 0.08 mcg/kg/min [0.03-0.15]. A prokinetic agent was ordered and administered in 7.83% of the population. There was one incident of suspected bowel ischemia and there were not any reported cases of bowel perforation.

Conclusions:
The average catecholamine vasopressor rate at which tube feeds were started was a median of 0.08 mcg/kg/min. Patients on high norepinephrine equivalents were statistically significantly more likely to require an anti-emetic dose compared to patients with low norepinephrine requirements. Initiation of enteral nutrition is likely safe at the catecholamine vasopressor rates seen in this study.

Evaluation of Efficacy Outcomes of Two Hydrocortisone Dosing Regimens in Patients in Septic Shock Based on Primary Source of Infection

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Learning objectives:

1. Discuss the impact of hydrocortisone dosing on efficacy outcomes in septic shock.
2. Identify the effect of hydrocortisone dosing on shock resolution and vasopressor requirements based on primary source of infection.

Purpose:
The 2021 Surviving Sepsis Campaign Guidelines provide a weak recommendation for using hydrocortisone 200 mg IV in septic shock with an ongoing requirement of vasopressors. However, there is no standardized hydrocortisone dosing in septic shock, and it is not known if optimal dosing may differ based on a patient's primary source of infection. The purpose of this study was to compare the safety and efficacy of hydrocortisone 100 mg IV every 8 hours (high-dose) and 50 mg IV every 6 hours (low-dose) based on a patient's identified source of infection.

Methods:
This study was an IRB-approved single-center, retrospective chart review of adults who received adjunctive therapy with either low-dose or high-dose hydrocortisone to treat septic shock. The objectives of this study were to evaluate the effect of low-dose and high-dose hydrocortisone on septic shock based on a patient's primary source of infection as measured by vasopressor-free days, 28-day mortality, cumulative vasopressor requirements, and time to initial shock reversal.

Results:
Initial screening identified 932 patients, and after evaluating inclusion and exclusion criteria, 63 patients were included in the final analysis. Pneumonia was the most common primary diagnosis (38.1%), followed by urinary tract infection (13, 20.6%), bacteremia (16%), intraabdominal infection (14.3%), unknown infection (6.3%), soft-skin and tissue infection (3.2%), and endocarditis (1.6%). Use of low-dose compared to high-dose hydrocortisone showed no significant difference in vasopressor-free days for pneumonia (9.0 vs. 11.0, $p = 0.688$), urinary tract infection (7.6 vs. 11.8, $p = 0.463$), or bacteremia (13.0 vs. 7.3, $p = 0.39$), or intraabdominal infection (7.9 vs. 0.3, $p = 0.11$).

Conclusions:
Choice of hydrocortisone dosing regimen was not associated with an increase in vasopressor free days based on primary source of infection in patients with septic shock.

Medication Therapy Management for Older Patients in a House Calls Program

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UAN: 0048-0000-23-140-L04-P

Learning Objectives:

1. Review the impact of pharmacist-led medication therapy management on clinical and economic outcomes
2. Identify billing opportunities for pharmacy services within a House Calls program

Purpose:

Pharmacists may directly bill for outpatient medication therapy management (MTM) services through the Centers for Medicare and Medicaid Services using the OutcomesMTM platform. Currently, Summa Senior Health pharmacists provide unbilled medication reviews for Summa House Calls (SHC) patients in preparation for weekly interdisciplinary team (IDT) meetings. The purpose of this project is to quantify the potential revenue from comprehensive medication reviews (CMRs) completed for SHC patients.

Methods:

Patients were identified for inclusion into this study based on review of IDT meeting agendas. CMRs were identified by the presence of a note from a geriatrics specialist pharmacist. CMR interventions were categorized and associated with reimbursement amounts based on OutcomesMTM-style interventions. Patients on a meeting agenda without a completed CMR were also documented.
The primary outcome was to quantify lost revenue per month for completed SHC medication reviews. Secondary outcomes included quantifying the average reimbursement per patient for each type of medication review and the projected lost revenue per month for omitted CMRs. This was based on data collected from the completed CMRs. Descriptive analysis was used.

Results:

A total of 123 patient charts were evaluated for 7 weeks of agendas. Fifty-five CMRs were completed. The estimated missed total revenue for completed CMRs per 4 weeks was $2708.57. The average missed revenue per CMR was $88 for new patients, $90.71 for transitional care/complex (TC/CPX) patients, $82.50 for annual wellness patients (AWVs), and $73.38 for focused medication reviews. The estimated missed revenue for patients without a CMR was $1,584 for new patients, $816.39 for TC/CPX patients, and $3382.50 for AWV patients. Total missed revenue per 4 weeks was $6013.08.

Conclusions:

Billing opportunities for outpatient pharmacist medication review services may provide income to support more pharmacist time to these services to improve patient care.

Evaluation of holding direct oral anticoagulation prior to hip and knee arthroplasty

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Learning Objectives:

1. Review dosing recommendations of Direct Oral Anticoagulation (DOAC) holding times
2. Evaluate the difference between holding times related to bleeding and thromboembolism (TE) risk

Purpose:
It is recommended that patients taking direct oral anticoagulants (DOACs) hold therapy prior to invasive procedures to decrease bleeding risk. However, holding anticoagulation can increase the risk of thromboembolism (TE). This study will evaluate the holding time of apixaban and rivaroxaban prior to total hip and knee arthroplasty and the risk of bleeding and TE.

Methods:
This was a retrospective cohort study that included patients greater than 18 years of age who took apixaban or rivaroxaban for any indication prior to a total hip or knee arthroplasty at a 250-bed community hospital from January 2019 to December 2021. The study evaluated post-procedural bleeding risk and TE risk 30 days after the procedure. The primary outcome was to evaluate the risk of TE and post-operative bleeding in patients who held DOACs before hip and knee arthroplasty for < 48 hours, 48-72 hours, and >72 hours. Secondary outcomes included comparing the difference between bleeding and TE risk between apixaban and rivaroxaban, comparing the difference between holding times and the risk of TE and bleeding, and comparing the difference between therapeutic bridging and the risk of TE and bleeding.

Results:
Seventy-nine patients were enrolled in this study. Two patients held their DOACs for <48 hours, 41 patients held 48 to 72 hours, and 36 patients held for > 72 hours. The primary outcome of DOAC holding time was not statistically significant for bleeding with a p-value of 0.18. No patients in the study experienced a TE at 30 days post-procedure discharge review. There was no statistically significant difference in the secondary outcomes.

Conclusions:
No clinical or statistical difference in incidence of bleeding or TE was found between the holding times of < 48 hours, 48 to 72 hours, and > 72 hours for apixaban and rivaroxaban.

Improving Compliance with American Diabetes Association Guidelines Through a Pharmacist-Led Diabetes Management Project

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UAN: 0048-0000-23-142-L01-P

Learning Objectives:

1. Explain the updated ADA guidelines treatment of type 2 diabetes mellitus.
2. Recognize the role that pharmacists can play in the transitions of managing T2DM in recently hospitalized patients.

Purpose:

In 2022, the American Diabetes Association (ADA) guidelines were updated to include other pharmacologic agents beyond metformin as potential first-line treatment options for type 2 diabetes mellitus (T2DM) based on patient-specific factors. Glycemic control at Aultman Alliance Community Hospital is often more focused on acute management and there is no process currently in place to ensure that patients are discharged on guideline-compliant medication regimen for their specific medical conditions. This study aims to assess and compare ADA guideline compliance of patients' diabetes regimen before and after pharmacist intervention within a rural, community hospital setting in patients with T2DM and either clinical ASCVD, high risk ASCVD, CKD, or CHF.

Methods:

This study is a single-center, retrospective chart review evaluating ADA compliance of patients' diabetes medication regimen before and after pharmacist intervention. Patients meeting inclusion criteria will be entered into the study and their diabetes medication regimen will be assessed for ADA compliance by a pharmacist. For patients whose regimens are not ADA compliant, a pharmacist will make recommendations to the hospitalist to start either an SGLT2-I or a GLP-1 agonist either while inpatient or upon discharge. A follow-up phone call within seven days post-discharge will also be completed to assess patient's medication adherence, side effects, and blood sugars for patients who were started on a new therapy per pharmacist recommendation. Inclusion criteria: Patients who are at least 18 years of age, are admitted to either the progressive care unit, intensive care unit, or senior care unit, has a diagnosis of type 2 diabetes mellitus with an A1c of ≥6.5% AND at least one of the following: clinical ASCVD, high risk of ASCVD, CHF, or CKD. Patients who are pregnant and/or have type 1 diabetes mellitus will be excluded from the study.

Results:

In progress

Conclusions:

In progress

Assessing the Impact of Consultant Pharmacist Directed Anticoagulation Management in the Post-Acute Care Setting

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Learning Objectives:

1. Review anticoagulant use within the post-acute skilled nursing facilities.
2. Identify the anticoagulation recommendations made regarding anticoagulant use.
3. Assess the impact of consultant pharmacists on anticoagulation management in the post-acute care setting.

Purpose:

In the United States, venous thromboembolism (VTE) is the third most prevalent cardiovascular disorder. According to a 2014 study conducted by The Office of the Inspector General (OIG), 31% of Medicare residents in post-acute skilled nursing facilities (SNF) experienced adverse events related to medication. Of these medication adverse events, 9% were related to bleeding associated with anticoagulant use. Pharmacists have shown to increase the safe use of anticoagulants, reduce the rate of VTEs and hospitalization, and lower associated care costs in other care settings.

Methods:

This study aimed to assess the impact of consultant pharmacists on anticoagulation management in the post-acute care setting. Participating pharmacists provided standard of care recommendations regarding anticoagulant use and reported data to ASCP. Aggregate data was provided to study research team for inclusion and analysis. Study outcomes included appropriateness of anticoagulation therapy as defined by American College of Chest Physicians, (ACCP), rate of acceptance for anticoagulation-related recommendations, frequency of inappropriate therapy per anticoagulant type, and rate of ADEs associated with inappropriate anticoagulant use.

Results:

Data was collected from November 2022-January 2023, during which 475 charts were assessed. Within the charts reviewed, 169 patients were receiving anticoagulation therapy, and 142 had recommendations sent to providers. Of the recommendations sent, 85% were accepted/accepted but modified, 6% were declined, and 8% had no response or the patient was discharged before follow-up.

Conclusions:

Further research is required to assess the impact of this study due to lack of power during analysis. However, preliminary data demonstrated the need for pharmacist involvement in anticoagulation management due to patients not receiving optimal care based on current guidelines.

Impact of anaerobic coverage on clinical outcomes in patients with suspected aspiration pneumonia

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Learning Objectives:

1. Review the 2019 IDSA community-acquired pneumonia guideline recommendations regarding aspiration pneumonia
2. Discuss the importance of antimicrobial stewardship and avoiding unnecessary antimicrobial coverage

Purpose:

Prior to the 2019 IDSA community-acquired pneumonia guideline updates, the widely accepted treatment for aspiration pneumonia (AP) included anaerobic coverage. New studies have shown anaerobes do not play a major role in the pathology of AP, which led to the removal of anaerobic coverage for most patients from the guideline recommendations. While many studies have looked at the prevalence of anaerobic bacteria in cultures, very few studies have looked at the difference in clinical outcomes in patients treated with and without anaerobic coverage. The purpose of this study was to evaluate the difference in clinical outcomes between patients with suspected AP who received antibiotics with anaerobic coverage versus those who did not.

Methods:

This study was a retrospective study which assessed patients with suspected aspiration pneumonia treated in the hospital between July 1, 2021 and June 30, 2022. Patients who were pregnant, immunocompromised, had a lung abscess or empyema, left against medical advice, transitioned to hospice/comfort care, or were hospitalized <48 hours were excluded from the study. Patients were divided into 2 groups: those who received anaerobic coverage versus those who did not receive anaerobic coverage. The primary endpoint of this study was time to clinical stability which was defined as improvement in cough/shortness of breath, leukocytosis improvement of at least 10%, afebrile ≥8 hours, and stable vital signs without the use of vasopressors. The secondary endpoints were time to treatment failure (defined as death or escalation of antimicrobial therapy), length of hospital stay, and total antibiotic duration (including antibiotics prescribed for discharge).

Results:

Data collection in progress.

Conclusions:

Final results and conclusions will be presented at the Ohio Pharmacy Residency Conference.

Liposomal Bupivacaine versus Ropivacaine, Epinephrine, Clonidine, and Ketorolac (R.E.C.K.) Syringes for Post-Operative Pain in Lumbar Laminectomy Surgery

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Learning Objectives:

1. Discuss the utility of liposomal bupivacaine and R.E.C.K. for postoperative analgesia
2. Compare clinical outcomes data and cost between liposomal bupivacaine and R.E.C.K.

Purpose:
To evaluate the cost-effectiveness of two readily utilized treatments in our health system, liposomal bupivacaine and a prefilled syringe containing a ropivacaine, epinephrine, clonidine, and ketorolac (R.E.C.K.) cocktail, in patients undergoing lumbar laminectomy surgery.

Methods:
A retrospective chart review was performed utilizing data collected from medical records of patients who were treated within an eight-hospital network from January 1, 2019 through July 31, 2022. Patients included were 18 years or older and underwent an elective lumbar vertebra laminectomy surgery receiving either liposomal bupivacaine or a compounded syringe containing ropivacaine, epinephrine, clonidine, and ketorolac (R.E.C.K.). The primary outcome was patient requirement of opioid medications post-operatively for pain control defined as morphine milligram equivalent (MME) requirement per day. Secondary outcomes included patient-pain level post operatively, scored utilizing the visual analog scale (VAS), and length of stay.

Results:
The average MME at 24 hours post-lumbar laminectomy was similar between liposomal bupivacaine and R.E.C.K. groups with an average total MME 24 hours post-operation of 16.5 and 18.6 respectively ($p = 0.769$). Average pain scores at 24 hours, 48 hours, and 72 hours were also similar between liposomal bupivacaine and R.E.C.K. groups. Patients who received liposomal bupivacaine had an average length of stay of 1.03 days while patients who received R.E.C.K. had an average length of stay of 1.09 days ($p = 0.090$).

Conclusions:
Compared to liposomal bupivacaine, R.E.C.K did not demonstrate statistically significant changes in MME requirements 24 hours post-operation, pain score averages, or patient length of stay when used for post-operative pain in lumbar laminectomy. Considering the results of this study and given the differences in group purchasing organization (GPO) pricing, considerable financial benefit exists to both the health system and patient in selecting the R.E.C.K syringe over liposomal bupivacaine in lumbar laminectomy cases.

Impact of a Community Pharmacist Led-Interventional Diabetes Management Program on Patient Decision Making and Population Health Measures

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Learning Objectives:

1. Describe the current environment for value-based care initiatives and the community pharmacists' role in delivering population health interventions.
2. Discuss implementation of an Interventional Diabetes Management Program in a large community pharmacy setting.
3. Identify the relationship between pharmacist recommendation for interventions that support population health outcomes and patient recipient of the recommendation.

Purpose:

The purpose of this study is to implement a pharmacist-led Interventional Diabetes Management Program to improve the quality of diabetes care. As the shift towards value-based care initiatives continue, there is a greater need for involving community pharmacies in population health interventions to help improve patient outcomes. Previous literature has evaluated the impact of pharmacist-led chronic disease management interventions, finding that community pharmacists can improve clinical outcomes in a wide array of diseases, especially in patients with diabetes. As the shift towards value-based care initiatives continue, there is a greater need for involving community pharmacies in population health interventions. It is critical that community pharmacies develop programs for providing patient-centered interventional care that support health outcomes and performance on population health measures. The primary objective of this study is to assess the impact of a pharmacist-led Interventional Diabetes Management Program on the receipt of preventive care services and appropriate use of medications. The secondary objective is to evaluate clinical markers for disease control, including patient change in Hemoglobin A1c (HbA1c) and blood pressure and change in performance on population health measures.

Methods:

The Program will be implemented in 2,200 pharmacies across 35 states. Patients will be identified via membership eligibility reports from a commercial payer and will be eligible for interventions if they are 18 years or older and fill medications for diabetes. The primary objective will include interventions for completion of preventive care services such as an initial disease assessment, comprehensive medication review, HbA1c testing, provider visits, vaccinations, statin therapy initiation, and medication adherence. The secondary objective will include interventions to perform or document patient's HbA1c and blood pressure. Researchers will evaluate completion rates for HbA1c and blood pressure testing. Performance on population health measures, including HbA1c control (<8.0%) and blood pressure control (<140/90 mmHg) will be measured beyond the residency year. Categorical data will be evaluated using the generalized estimating equation and continuous data will be evaluated using repeated measures ANCOVA.

Results:

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

Conclusions:

Final conclusions will be presented at the Ohio Pharmacy Residency Conference.

Safety of Fixed Dose Prothrombin Complex Concentrate for Warfarin and Direct Oral Anticoagulant Reversal

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Learning Objectives:

1. Evaluate the thrombosis and rebleeding risk of fixed-dose compared with weight-based dosing of prothrombin complex concentrate (PCC) in warfarin and direct oral anticoagulant (DOAC) reversal.
2. Compare differences in outcomes of PCC dose administered per kilogram, time to administration, hospital length of stay, and mortality in warfarin versus DOAC reversal.

Purpose:
PCC is used for warfarin and DOAC reversal and is associated with thromboembolic complications. There is limited literature evaluating thromboembolic risk associated with weight-based-dosing compared to fixed-dose PCC. The purpose of this study was to compare the safety of these two regimens.

Methods:
This retrospective, single-center analysis included adult patients admitted to Bon Secours Mercy Health - St. Vincent Medical Center who received PCC from January 2018 to August 2022. The primary endpoint was a composite of the incidence of thromboembolic complications within 14 days and/or rebleeding 7 days post-PCC administration. Secondary endpoints included if and when anticoagulants were resumed, international normalized ratio improvement, intensive care unit and hospital length of stay (LOS), in-hospital mortality, and time to PCC administration.

Results:
A total of 126 patients were included. There were 78 patients in the warfarin group and 48 patients in the DOAC group. Fixed-dose PCC was received by 46 (59%) of patients on warfarin and 13 (27%) on DOACs. Of fixed-dose regimens, thromboembolic complications occurred in 2 (4%) of those on warfarin and none on DOACs, while rebleeding occurred in 5 (11%) of those on warfarin and 2 (15%) on DOACs. Of weight-based-dosing regimens, thromboembolic complications occurred in none on warfarin and 1(3%) on DOACs, while rebleeding occurred in 3 (9%) of those on warfarin and 3 (9%) on DOACs. The fixed-dose group received an average of 15 units per kilogram of PCC compared to an average of 32 units per kilogram of PCC in the weight-based-dose group. The average time to administration was 159 minutes (standard deviation 177.8) in the fixed-dose group and 178 minutes (standard deviation: 148.6) in the weight-based-dosing group. The average hospital LOS was 7 days (standard deviation: 5.7) in the fixed-dose group and 6 days (standard deviation: 4.5) in the weight-based dose group. Mortality was observed in 15 (25%) of fixed-dose patients and 15 (22%) of weight-based dosing patients.

Conclusions:
Preliminary data analysis suggests a similar percentage of thromboembolic events between groups, a higher percentage of rebleeding in the fixed-dose DOAC group, and a similar percentage of rebleeding in warfarin groups. Fixed-dosing resulted in lower PCC doses per kilogram, lower time to administration, and numerically similar hospital LOS as well as mortality when compared with weight-based dosing.

Exploring trends in student evaluations of advanced pharmacy practice experience rotations

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Learning Objectives:

1. Explain the importance of advanced pharmacy practice experiences (APPEs) for the development of student pharmacists.
2. List the factors that, according to student pharmacist survey responses, make for positive and negative APPE experiences.

Purpose:

To identify attributes students like and do not like about their preceptors and rotation sites during advanced pharmacy practice rotations (APPEs).

Methods:

A free-response survey was administered to 945 graduating Doctor of Pharmacy students at The University of Toledo where students were asked to list favorable and unfavorable attributes about their APPE preceptors and rotation sites. A thematic analysis was performed using Dedoose, a qualitative data analysis application. Prevalent trends were identified by measuring how frequently each coded theme was applied to responses.

Results:

Students who discussed positive preceptor attributes (n=720) most frequently listed personality traits (43%), caring about student success (33%), and being a good teacher (22%). Students who discussed negative preceptor attributes (n=499) most frequently listed little contact time (43%), unclear expectations (19%) and condescending attitude (15%). Students who discussed positive rotation site attributes (n=935) most frequently listed developing clinical skills (33%), personality traits of site staff (23%), and interprofessional experiences (22%). Students who discussed negative rotation site attributes (n=829) most frequently listed “busy-work” (26%), little clinical development (25%), and little contact time with preceptors (21%).

Conclusions:

According to student survey responses, there was often a correlation between favorable APPE experiences and high contact time with preceptors; preceptors having positive personality traits was often cited as an important factor. There was often a correlation between unfavorable APPE experiences and low contact time with preceptors. Students also cited “busy-work” and unclear expectations during the rotation as contributing factors to negative rotation experiences.

Safety of piperacillin-tazobactam administration in heart failure patients with reduced ejection fraction

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Learning Objectives:

1. Determine whether a correlation exists between piperacillin-tazobactam (PTZ) administration and worsening heart failure in patients with heart failure with reduced ejection fraction (HFrEF)
2. Provide evidence to assist antimicrobial therapeutic decision-making for hospitalized patients with HFrEF

Purpose:
Pre-existing heart failure (HF) has been cited by providers as a reason to prefer alternative antimicrobial therapy to PTZ due to its sodium content. While sodium's role in intravascular volume homeostasis is well documented, a correlation between sodium restriction and improved HF outcomes is not well established. Furthermore, choosing alternative therapy when PTZ is indicated may increase resistance patterns and/or healthcare costs. Research regarding the safety of PTZ use in patients with HFrEF is lacking.

Methods:
This single-center, retrospective study assessed the incidence of worsening HF in hospitalized patients that received PTZ compared to cefepime. Worsening HF was defined as a composite of the following occurring subsequent to antimicrobial initiation: (1) initiation of diuretic therapy, (2) increased diuretic requirements, or (3) thoracentesis. Secondary/safety outcomes compared change in serum sodium concentration, length of hospitalization, and 30-day HF readmissions. Adult patients diagnosed with HFrEF who received at least three doses of PTZ or cefepime between January 1, 2021 and January 1, 2022 were included. Patients were excluded if they received both antibiotics, had poor kidney function (CrCl<20 mL/min), or received hypertonic saline, salt tablets, or fludrocortisone during their hospitalization.

Results:
Primary analysis included 40 patients (24 received PTZ, 16 received cefepime). The primary endpoint was met by 7 of the 24 patients (29.2%) that received PTZ, and by 7 of the 16 patients (43.8%) that received cefepime (P=0.34). Diuretic initiation after antibiotic administration occurred in 3 patients (18.8%) and 5 patients (20.8%) and diuretic increase occurred in 6 patients (37.5%) and 5 patients (20.8%) in the cefepime and PTZ arms respectively. Thoracentesis occurred for 1 patient (6.3%) and 3 patients (12.5%) in the cefepime and PTZ arms respectively. Median serum sodium level increases were 1 (IQR = 0, 2.5) mg/dL and 0 (IQR = 0, 4) mg/dL and the median length of stay was 8.5 (IQR = 5.5, 12.5) and 6 (IQR = 4, 10) days in the cefepime and PTZ arms respectively. There were no 30-day readmissions for HF.

Conclusion:
These results reveal no signs of worsening HF for patients that received PTZ compared to cefepime.

Economic evaluation of implementing pharmacist-led genotype-guided selection of P2Y12 Inhibitor following percutaneous coronary intervention

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Learning Objectives:

1. Describe the role of *CYP2C19* genotype-guided P2Y12 Inhibitor selection following PCI
2. Describe the methodology of cost-effectiveness analysis using decision analytic modeling for *CYP2C19* genotype testing

Purpose:

Patients with acute coronary syndrome (ACS) who undergo percutaneous coronary intervention (PCI) typically receive dual antiplatelet therapy (DAPT) consisting of low-dose aspirin and a P2Y12 inhibitor (e.g., clopidogrel, prasugrel, ticagrelor). Clopidogrel is bioactivated principally by CYP2C19 which is subject to genetic variation leading to variability in enzyme function between individuals. Pharmacogenomic (PGx) testing can determine *CYP2C19* genotypes and inform selection of P2Y12 inhibitors, improving safety and effectiveness at the individual patient level. Clinical studies show selecting a P2Y12 inhibitor after PGx analysis of *CYP2C19* (genotype-guided selection) reduces major bleeding and major adverse cardiovascular events (MACE) after PCI for ACS. Economic and clinical impact of *CYP2C19* genotype-guided selection of P2Y12 inhibitors post-PCI at community medical centers (CMC) is limited. The purpose of this study is to determine the most cost effective DAPT strategy after PCI for ACS at a CMC.

Methods:

This study is a decision analytic model being conducted at OhioHealth Mansfield Hospital (MH) under the perspective of the provider. The analysis will compare the projected direct medical costs and effectiveness measured in quality-adjusted life years (QALYs) of the DAPT selection strategies, including universal ticagrelor DAPT, universal clopidogrel DAPT, and genotype-guided DAPT over a one-year time horizon. Average and annualized patients from FY18-21 who underwent a PCI for ACS at MH who received DAPT were included in the study. Patients on single-antiplatelet therapy were excluded. Model inputs include frequency of CYP2C19 genotypes and costs associated with adverse outcomes: MACE and major bleeding. Data are sourced from published literature and institutional data. Cost effectiveness will be evaluated by incremental cost effectiveness ratio (ICER) and net monetary benefit. A sensitivity analysis will be conducted on variables for which values are estimated.

Results:

Pending, to be presented at OPRC meeting.

Conclusions:

Pending, to be presented at OPRC meeting.

Investigation of Urine Drug Testing Results in Patients Receiving Medication for Opioid Use Disorder in a Federally Qualified Health Center

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Learning Objectives:

1. Review current literature regarding the use of urine drug testing (UDT) among patients being treated for opioid use disorder (OUD) with buprenorphine/naloxone.
2. Discuss the current process for evaluating UDT results within a substance use disorder (SUD) clinic.
3. Determine the potential relationships between timing of medication administration and adherence on urine metabolite levels.

Purpose:
Buprenorphine, alone and in combination with naloxone, is a first-line treatment option for opioid use disorder (OUD). However, knowledge regarding the application of urine drug testing (UDT) results for patients taking this medication is lacking. UDT results provide quantitative information on the amount of buprenorphine, norbuprenorphine, naloxone, and sometimes creatinine in the urine, which can be beneficial when determining if urine has been adulterated. Currently, the literature is deficient in examining the relationship between the time of last buprenorphine/naloxone dose and UDT levels, or reported adherence and UDT levels, which are two important factors when assessing UDT results.

Methods:
This study is a retrospective chart review that evaluated the relationship between the time of last buprenorphine/naloxone dose and patients' urine buprenorphine levels and the amount of buprenorphine/naloxone reported to be taken in the previous seven days and patients' urine norbuprenorphine levels. This study included patients seen at the site's substance use disorder (SUD) clinic between August 2022 and March 2023 and prescribed buprenorphine/naloxone. Data was gathered on patients' demographic information, adherence, time of last dose, and UDT results. Data was analyzed using Pearson correlation coefficients and descriptive statistics.

Results:
Preliminary data collection and analysis identified 21 unique patients with a total of 74 urine samples. The average patient age was 47.05 years. Most patients were male (70%), and all patients were of Non-Hispanic/Latino ethnicity. There was no statistically significant correlation found between time of last dose and urine buprenorphine level ($r=0.0764$, $p=0.52$) or between patient reported weekly dose and urine norbuprenorphine level ($r=-0.0044$, $p=0.88$).

Conclusions:
Initial data analysis showed no correlations for either primary objective; however, data collection is still in process. Further research is necessary regarding the relevance of UDT levels to proper dosing of buprenorphine/naloxone and factors affecting UDT levels.

A retrospective review of emergency department use of droperidol in the community hospital setting

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UAN: 0048-0000-23-152-L01-P

Learning Objectives:

1. Describe droperidol use and monitoring practice in the emergency department (ED) at two community hospitals
2. Evaluate the use of antiemetic rescue medications after droperidol administration in the ED

Purpose:

University Hospitals St. John Medical Center and Elyria Medical Center have recently introduced droperidol into their ED, with recommendations of proper ECG monitoring. Proper monitoring requires ECG to be obtained at baseline and 10 to 30 minutes after administration to assess the risk for QT_c prolongation. Due to the US Food and Drug Administration (FDA) black boxed warning in 2001, regarding concerns for QT_c prolongation and torsade de pointes, droperidol use has been limited. This warning has been controversial with more recent literature supporting safety of droperidol at doses of 2.5mg or less. The purpose of this study is to analyze the use of droperidol in the ED setting. The primary endpoint is to evaluate the number of rescue medications given to patients 60 minutes after receiving droperidol for nausea and vomiting. The secondary endpoints include: use of droperidol by indication and number of patients that received proper monitoring via ECG.

Methods:

This is a retrospective review of patients who have received droperidol in two community emergency departments. This data will be collected from October 1, 2022 to April 1, 2023. Patients who received at least one dose of droperidol in the ED will be included in this review. Patients will be excluded if they are less than 18 years of age and/or pregnant. Descriptive statistics will be utilized for data analysis.

Results:

Data analysis is ongoing. Results and conclusions will be presented at the 2023 Ohio Pharmacy Resident Conference.

Conclusions:

Data analysis is ongoing. Results and conclusions will be presented at the 2023 Ohio Pharmacy Resident Conference.

Case-control evaluation of the ratio of calcium replaced to blood administered during massive transfusion in trauma patients

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UAN: 0048-0000-23-153-L01-P

Learning Objectives:

1. Describe the pathogenesis of hypocalcemia in massive transfusion
2. Report the relationship between calcium supplementation and elemental blood products

Purpose:
Patients with severe trauma often experience extensive acute blood loss and require activation of massive transfusion protocols (MTP) for resuscitation. For a number of reasons, including citrate toxicity, hypocalcemia is a common occurrence in MTP. Hypocalcemia during MTP is associated with increased mortality, however optimal calcium replacement has not been elucidated. The purpose of this study was to investigate the ratio of calcium supplementation to blood products administered during MTP to propose a strategy for mitigating hypocalcemia.

Methods:
This IRB-approved single-center retrospective case-control study was conducted at an urban, level I trauma center. All patients aged 15 and older with a trauma alert and MTP activation within 4 hours of admission between January 1, 2016 and December 31, 2021 were included. Patients who expired in the trauma bay and those who sustained catastrophic head injuries were both excluded. The primary outcome was the ratio of elemental calcium administered to blood products transfused, stratified by lowest ionized calcium (iCa) level, including severe hypocalcemia (iCa <3.0 mg/dL), hypocalcemia (iCa 3-4 mg/dL), and normocalcemia (iCa >4.0 mg/dL). Additional outcomes included all-cause inpatient mortality and assessment of coagulopathies and metabolic derangements.

Results:
A total of 259 patients met study criteria, with 84 severely hypocalcemic, 70 hypocalcemic, and 105 normocalcemic. Across all strata, a ratio of 30 mg elemental calcium was replaced per unit of blood product administered, with no statistically significant differences between groups (p=0.460). Secondary outcomes revealed statistically significant metabolic and coagulopathic derangements, worsening with increasing degree of hypocalcemia.

Conclusions:
Consistent with prior literature, hypocalcemia was associated with worse outcomes in a trauma population undergoing massive transfusion. Based on these data, we are proposing an empiric replacement of no less than 30 mg elemental calcium per unit of blood transfused for future exploration in our institutional MTP.

Enteral naloxone versus methylnaltrexone use for refractory constipation

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Learning Objectives:

1. Discuss the importance of managing constipation and refractory constipation
2. Identify medication treatment options for constipation and refractory constipation

Purpose:

Refractory constipation after a failed bowel regimen remains a challenge in healthcare. Enteral naloxone has been thought of as a potential option for use in patients experiencing refractory constipation based on its antagonism at the opioid receptors of the gastrointestinal tract. The aim of this study is to compare enteral naloxone to another refractory option, methylnaltrexone, and examine the percentage of bowel movements within 48 hours in community hospital patients. Methylnaltrexone is a very expensive medication, so seeing similar or even better rates of success with enteral naloxone could prove to be beneficial for a hospital.

Methods:

This retrospective study was approved by the Institutional Review Board. The electronic medical record was used to identify patients from four community hospitals who received either enteral naloxone or methylnaltrexone the day after a failed attempt of a different bowel regimen from February 1st, 2021, to October 25th, 2022. The primary outcome will compare the percentage of patients achieving a positive bowel movement within 48 hours between the groups who received either enteral naloxone or methylnaltrexone. Data collection will include average time to bowel movement, number of naloxone or methylnaltrexone doses given to lead to a bowel movement, and adverse effects from naloxone or methylnaltrexone. These collection points will all be examined using various statistical tests that best fit the outcome.

Results:

Final results will be presented at the Ohio Pharmacy Resident Conference.

Conclusions:

Conclusions will be presented at the Ohio Pharmacy Resident Conference.

Outcomes from Weight-based Intravenous Heparin Dosing in Morbid Obesity for Acute Coronary Syndromes, Atrial Fibrillation, Atrial Flutter, and Peripheral Artery Disease

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UAN: 0048-0000-23-155-L01-P

Learning Objectives:

1. Discuss the effects of obesity on the pharmacokinetics and pharmacodynamics of unfractionated heparin.
2. Recognize the potential risks of persistently subtherapeutic or supratherapeutic activated partial thromboplastin time (aPTT) in patients receiving heparin for acute coronary syndrome.

Purpose:

In obese patients, pharmacokinetic properties including volume of distribution may be altered. This may warrant modifications to the traditional dosing strategies used for medications such as heparin. Data in venous thromboembolism has demonstrated improved outcomes in patients receiving heparin when activated partial thromboplastin time (aPTT) or unfractionated heparin assay (UHA) is therapeutic within 24 hours. Institution protocols may specify maximum heparin starting doses, which could result in lower initial doses, a potential delay in therapeutic aPTT or UHA, and worse outcomes in obese patients. This study aims to evaluate the efficacy of the existing Detroit Medical Center (DMC) routine dose heparin nomogram in morbidly obese patients, and to determine an optimal dosing strategy for this population.

Methods:

This retrospective chart review will be conducted at four university-affiliated hospitals between January 2021 and July 2022. Patients who received intravenous heparin for $\geq$ 24 hours dosed using the existing DMC nomogram for the indication of acute coronary syndrome, atrial fibrillation, atrial flutter, or peripheral artery disease will be included. Patients will be excluded if they received heparin using any other dosing strategy, are < 18 years old, pregnant or lactating, or receiving continuous renal replacement therapy or extracorporeal membrane oxygenation. The study group of morbidly obese patients will include those with a Body Mass Index (BMI) $\geq$ 40 kg/m^2 or a total body weight $\geq$ 150 kg. The primary outcome is attainment of a therapeutic aPTT or UHA within 24 hours of heparin initiation in morbidly obese versus non-morbidly obese patients. Secondary outcomes include time to reach target aPTT or UHA, infusion rate required to attain target aPTT or UHA, hemorrhagic events, and thrombotic events.

Results:

Data analysis is in process.

Conclusions:

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

Perception of a Pharmacist-led Medication Reconciliation Program at a Rural Community Hospital

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Learning Objectives:

1. Identify common types of medication errors at the point of admission medication reconciliation that may lead to patient harm.
2. Demonstrate ways to integrate pharmacists into the medication reconciliation process to mitigate the risk of medication errors.

Purpose:

Studies suggest that medication histories have significantly more errors when collected by non-pharmacy personnel as compared to pharmacists. One study demonstrates that at least one error will be identified in 87% of medication lists collected by non-pharmacy personnel. These errors are associated with negative outcomes such as adverse drug events, emergency department visits, hospital readmissions, and delays in patient care. Accurate and complete medication histories conducted during hospital admission help alleviate the risk of medication errors. The purpose of this study is to implement a pharmacist-led medication reconciliation program and assess the perceived value regarding the prevention of medication errors.

Methods:

This prospective implementation study was conducted at Firelands Regional Medical Center from December 2022 through February 2023 and included patients 18 years and older with an inpatient admission. Pediatric patients as well as those unable to participate in medication reconciliation due to a critical illness were excluded from the study. To evaluate the effect of a pharmacist-led medication reconciliation service, a clinical pharmacist completed medication reconciliation on the medical floors for patients admitted after the initial medication history had been collected in the emergency department. Prior to implementation, the internal medicine hospitalist staff received education regarding the integration of pharmacist-led medication reconciliation into their workflow. The primary outcome evaluated was the perceived value and satisfaction of a pharmacist-led medication reconciliation program as indicated by hospitalist staff and pharmacists in a pre and post survey. Secondary outcomes evaluated were number of medication errors corrected by a pharmacist, types of errors identified, and average time taken to complete medication reconciliation.

Results:

Results from this study will be presented at the Ohio Pharmacy Residency Conference in May 2023.

Conclusions:

Conclusions from this study will be presented at the Ohio Pharmacy Residency Conference in May 2023.

Direct Oral Anticoagulants versus Warfarin Outcomes in Patients with Liver Dysfunction

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UAN: 0048-0000-23-157-L01-P

Learning Objectives:

1. Define the current gaps in literature regarding use of Direct-acting oral anticoagulants (DOACs) in patients with liver dysfunction
2. Discuss the current and future role of DOACs in this patient population in comparison to warfarin

Purpose:
Direct-acting oral anticoagulants (DOACs) have become first-line options for many conditions requiring anticoagulation. Despite widespread use of DOACs, patients with liver impairment were excluded from landmark clinical trials that led to their approval, thus making their role unclear in this patient population. The purpose of this study is to compare the safety and efficacy of DOACs in patients with hepatic dysfunction compared to those receiving warfarin.

Methods:
This study is a retrospective, single-center cohort that included patients admitted to the University of Toledo Medical Center from November 4, 2011 through August 1, 2022 with a diagnosis of cirrhosis or liver disease and a concomitant diagnosis of non-valvular atrial fibrillation or venous thromboembolism. Additional inclusion criteria were age 18 years or older with apixaban, rivaroxaban, or warfarin listed as home medications. The primary outcome is the difference in the composite of new or worsening thromboembolic events, bleeding events, and mortality between the patients receiving DOACs vs. those receiving warfarin. Secondary endpoints include a comparison of the individual components of the primary composite outcome. An evaluation of the primary composite outcome in subgroups of patients with Child-Pugh class A, B, and C, and in patients with dose-reductions for liver impairment vs. no dose reductions were also included as secondary outcomes.

Results:
A total of 47 patient encounters were included in the final analysis. Of these encounters, 12 included patients taking a DOAC, with 35 taking warfarin. The primary outcome was observed in 9 patients in the warfarin group (25.7%) and 5 patients in the DOAC group (41.7%), $p = 0.297$.

Conclusions:
This study did not determine any significant difference in the incidence of the primary outcome between patients using DOACs vs. warfarin with liver impairment. Limitations in the study population and available retrospective data warrant future studies in this area.

Evaluation of hypertension in patients receiving vascular endothelial growth factor receptor inhibitors

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Learning Objectives:

1. Recall the background of vascular endothelial growth factor (VEGF) inhibitors: mechanism of action, place in therapy, and adverse effects.
2. Identify the incidence in VEGF inhibitor induced hypertension and need for evidence based antihypertensive treatments.
3. Discuss the results of a retrospective cohort study evaluating the blood pressures and blood pressure therapies of patients receiving treatment with a vascular endothelial growth factor (VEGF) inhibitor.

Purpose:

Vascular endothelial growth factor (VEGF) inhibitors inhibit angiogenesis by binding to VEGF and interrupting the intracellular signaling pathway. Often these agents are combined with chemotherapies and other immunotherapies to slow down and stop tumor growth. Some side effects that are associated with this class of medications are thromboembolic events, impaired wound healing, fatigue, diarrhea, and hand-foot syndrome; however, one of the most common is hypertension. According to the Common Terminology Criteria for Adverse Events (CTCAE), hypertension is defined as a disorder characterized by a pathological increase in blood pressure, which is further characterized by a grading scale. However, there is no defined pathway for which anti-hypertensive agents should be added based on the grade of hypertension. The purposes of the study are to evaluate the blood pressures and blood pressure therapies of patients receiving treatment with a vascular endothelial growth factor receptor (VEGF) inhibitor at baseline and periodically (3, 6, 9, 12 months) throughout treatment.

Methods:

This study is a retrospective, single-center cohort that included patients initiated on anti-VEGF tyrosine kinase inhibitor (TKI) or biologic therapy at the Toledo Clinic Cancer Center during the study time frame of September 10, 2017, to September 10, 2022.

The primary endpoint is to compare anti-hypertensive regimens for treating blood pressure in patients using VEGF inhibitors by evaluating the mean change in systolic blood pressure (SBP) from initiation or dose increase of an antihypertensive. The secondary endpoints include incidence of the addition of anti-hypertensive medications with VEGF inhibitors induced hypertension, response to chemotherapy treatment 12 months after initiation of VEGF inhibitor-induced hypertension, and time to treatment interruption or dosage modification due to hypertension associated to VEGF inhibitors.

Results:

Results will be presented live at the 2023 Ohio Pharmacy Resident Conference.

Conclusions:

Final conclusions will be presented live at the 2023 Ohio Pharmacy Resident Conference.

Evaluation of risk factors for Methicillin-Resistant *Staphylococcus aureus* in patients with sepsis

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UAN: 0048-0000-23-159-L01-P

Learning Objectives:

1. Review current guideline recommendations for empiric use of antibiotics with Methicillin-Resistant *Staphylococcus aureus* (MRSA) coverage.
2. Describe local patient characteristics and identify risk factors in medical intensive care unit (MICU) patients with sepsis at OhioHealth Riverside Methodist Hospital.

Purpose:
2021 Surviving Sepsis Campaign guidelines state the decision to use empiric antimicrobial therapy to cover Methicillin Resistant *Staphylococcus aureus* (MRSA) should be determined based on patient and contextual risk factors. 2019 American Thoracic Society/Infectious Disease Society of America (ATS/IDSA) Hospital-Acquired Pneumonia (HAP) guidelines recommend locally validating risk factors for resistant bacteria such as MRSA. Current literature is lacking and shows inconsistencies in which risk factors are correlated with MRSA. The purpose of this study is to characterize local risk factors for MRSA-associated infection in critically ill patients with sepsis.

Methods:
This single-center, retrospective chart review evaluated patients admitted to the medical intensive care unit (MICU) at OhioHealth Riverside Methodist Hospital between January 1, 2021 and June 30, 2022. Patients were included if they had a documented diagnosis of sepsis and cultures collected with 48 hours of diagnosis. Patient characteristics data originally recorded in the course of clinical care were reviewed for those with MRSA growth on cultures compared to those without.

Results:
A total of 69 patients evaluated met the inclusion criteria for this study. There were 3 patients in the MRSA group and 66 patients in the control group. Twenty-seven risk factors were evaluated in each group. Positive MRSA nasal polymerase chain reactions (PCRs) were documented in 66.67% of patients in the MRSA group and 4.48% of the control group (p=0.01). No statistically significant differences were observed in the other risk factors studied.

Conclusions:
Positive MRSA nasal PCRs in the MRSA group was the only statistically significant risk factor identified among critically ill patients diagnosed with sepsis. Larger studies are needed in order to further evaluate these risk factors.

Evaluation of proteinuria monitoring practice patterns and treatment implications in patients with cancer receiving bevacizumab products

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Learning Objectives:

1. Identify various laboratory tests used to monitor proteinuria associated with bevacizumab therapy
2. Review current literature and recommendations pertinent to the frequency and type of proteinuria monitoring with bevacizumab therapy

Purpose:

Proteinuria is a well-known toxicity of bevacizumab which can lead to kidney injury or nephrotic syndrome. Various monitoring modalities can be used to detect the development of proteinuria such as urine dipstick, 24-hour urine protein, urine-protein-to-creatinine-ratio, and urinalysis. The prescribing information recommends monitoring for proteinuria with urine dipstick analysis during therapy and undergoing reassessment with a 24-hour urine collection for any dipstick readings 2+ (grade 2) or greater. It recommends holding bevacizumab for proteinuria ≥2g/24 hours, resuming when <2g/24 hours, and discontinuing for development of nephrotic syndrome or proteinuria >3.5g/24 hours (grade 3+). The prescribing information mentions a post-marketing safety study which demonstrates a poor correlation between UPCR and 24-hour urine protein. There is little guidance on the frequency of monitoring and management of those that experience bevacizumab-induced proteinuria, and previous literature has suggested routine monitoring has limited clinical significance.

Methods:

This retrospective descriptive study includes 100 adult patients who received a bevacizumab product for a malignant condition at any OhioHealth facility from April 15, 2022 to October 15, 2022. Patients were excluded if they received less than three doses of a bevacizumab product, were pregnant, incarcerated, allergic to bevacizumab or any of its ingredients, or receiving a bevacizumab product as part of an investigational study. The primary objective is to describe the average number of proteinuria tests ordered over the course of therapy. Secondary outcomes include evaluating the incidence and time to occurrence of grade 2+ proteinuria, potential risk factors and medications that can lead to proteinuria as defined previously in literature, and any treatment implications of an abnormal proteinuria result on bevacizumab therapy.

Results:

Results to be presented at the 2023 Ohio Pharmacy Residency Conference.

Conclusions:

Conclusions to be presented at the 2023 Ohio Pharmacy Residency Conference.

Sedation practices following rapid sequence intubation: emergency department versus critical care

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Learning Objectives:

1. Review guideline recommendations for managing analgesia and sedation
2. Identify guideline-preferred sedation agents

Purpose:
Current critical care (CC) analgesia and sedation guidelines recommend targeting light sedation with dexmedetomidine or propofol over continuous infusion benzodiazepines in mechanically ventilated (MV) patients. Limited data exists on initial sedation selection following rapid sequence intubation (RSI) in CC patients compared to emergency department (ED) patients. This study aims to fill the gap in the literature by comparing the initial continuous infusion sedative selected following RSI based on location - ED versus the intensive care unit (ICU).

Methods:
This retrospective, single-center chart review included patients admitted to OhioHealth Riverside Methodist Hospital from June 2019 to June 2022 who underwent RSI in the ED or in the ICU. To describe changes in sedation upon transfer to the ICU, admitting orders were compared to ED orders. To compare patient outcomes, data collection included duration of MV, ICU length of stay (LOS), hospital LOS, disposition, and change in continuous sedation infusion throughout hospital admission. Changes in sedation were subdivided into three categories: no change in sedation, lighter sedation, and deeper sedation.

Results:
In total, 169 patients were analyzed. After RSI, propofol was ordered for 102 (60.4%) patients and dexmedetomidine for 15 (8.9%) patients. The ED subgroup consisted of 82 patients versus 87 in the ICU. Upon transfer to the ICU, 70 (85.4%) patients had no change in sedation, 5 (6.1%) patients encountered lighter sedation, 3 (3.7%) patients transitioned to deeper sedation, and 4 (4.9%) patients had no sedation ordered. Throughout the hospital stay, 113 (66.9%) patients had no change in sedation, 38 (23.1%) patients switched to lighter sedation, and 17 (10.1%) patients were converted to deeper sedation.

Conclusions:
Patients in Riverside's ED are being appropriately sedated after RSI with guideline recommended agents and are being transferred to the ICU with no immediate change in sedation.

Evaluation of N-acetylcysteine in Acute Liver Failure

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Learning Objectives:

1. Discuss common etiologies of acute liver failure encountered in the intensive care unit
2. Review pathophysiology and recommended use of N-acetylcysteine in the treatment of acute liver failure

Purpose:
N-acetylcysteine (NAC) has been well established for the treatment of acetaminophen-induced acute liver failure (AI-ALF) and more recently proposed for the treatment of non-acetaminophen-induced acute liver failure (NAI-ALF). Despite controversy in its utility, the use of NAC in NAI-ALF is increasing yet highly variable. The purpose of this study is to evaluate use of NAC irrespective of etiology in acute liver failure.

Methods:
This retrospective chart review, single-centered study evaluated all patients with ALF who received NAC from July 1st, 2018 to July 1st, 2022. The primary outcome was to evaluate in-hospital mortality at OhioHealth Riverside Methodist Hospital. Secondary outcomes include intensive care unit (ICU) length of stay, total hospital length of stay, and occurrence of those transferred to a transplant center.

Results:
This study included 221 patients with ALF who received NAC (133 patients with NAI-ALF and 88 patients with AI-ALF). The mortality rate was similar between patients with NAI-ALF and AI-ALF, (48.9% vs 12.5% respectively, $p = 0.32$). The average intensive care unit length of stay was comparable between patients with NAI-ALF and AI-ALF (8.22 days vs 4.05 respectively, $p = 0.20$), however, the total length of stay for NAI-ALF was determined to be significantly longer than AI-ALF (8.22 days and 4.05 days, respectively $p = <0.001$). The overall number of patients transferred between the two groups was not statistically significant ($p = 0.68$).

Conclusions:
This study demonstrated that NAC utilization in NAI-ALF does not show statistically different outcomes compared to NAC use in AI-ALF. This retrospective study provides guidance for specific areas of improvement in optimizing NAC utilization in NAI-ALF, such as dosing and timing of initiation.

Efficacy and Safety of Factor Xa Inhibitors in Low Body Weight Patients

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Learning Objectives:

1. Assess the use of direct oral anticoagulants in low body weight population based on current literature
2. Discuss the safety and clinical outcomes of direct oral anticoagulants in low body weight patients

Purpose:
Factor Xa (FXa) inhibitors have become the cornerstone treatment for patients with atrial fibrillation (AF) and venous thromboembolism (VTE). A paucity of data exists to guide management of these agents in low body weight patients. The goal of this study is to determine the safety and efficacy of FXa inhibitors in this population.

Methods:
This is a multicenter, retrospective, observational study conducted across 22 hospitals within Ascension Health. Adult patients with low body weight (weight ≤ 60 kg or BMI < 18 kg/m^2) admitted with history or newly diagnosed AF or VTE and having received at least one dose of rivaroxaban, apixaban or warfarin between January 1, 2012 and January 31, 2022 were included. Patients were excluded if they had severe liver disease, contraindicated concomitant medications, pregnancy, major bleeding upon hospital admission, or valvular AF. The primary outcome is to evaluate the time to the first major bleeding event.

Results:
A total of 2208 patients were included in a preliminary analysis. There was no significant difference in major bleeding in patients receiving warfarin versus FXa inhibitors (5.5% vs. 4.2%, p = 0.17). No significant differences were found in thromboembolism (6.7% vs. 5.5%, p = 0.3), composite bleeding (7.8% vs. 5.9%, p = 0.11), and all-cause mortality (12.7% vs. 11.2%, p = 0.32). After adjusting for confounders, no significant differences were found in major bleeding (HR 0.9, 95% CI 0.59-1.49, p= 0.65), thromboembolism (HR 0.99, 95% CI 0.64-1.54, p = 0.98), or composite bleeding (HR 0.82, 95% CI 0.57-1.19, p = 0.29).

Conclusions:
Based on our preliminary analysis, there are no significant differences in safety and efficacy outcomes between the use of warfarin and DOACs in patients with low body weight.

Effect of extended pharmacist involvement in discharge transitions of care on hospital readmission rates: prospective, randomized, parallel arm design trial

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Learning Objectives:

1. Review the importance of pharmacist involvement at discharge transitions of care
2. Describe the impact of extended pharmacist involvement on 30 day ED visits and inpatient readmission rates

Purpose:
Pharmacist involvement in transitions of care has been shown to improve patient outcomes and reduce readmission rates. In previous studies, pharmacists evaluated the safety and efficacy of medication therapy to decrease readmission rates. Results from this study could change pharmacists' current practice in discharge counseling by incorporating the extended pharmacist tasks into daily work flow and provide a financial benefit for hospital reimbursement by reducing 30 day readmission rates.

Methods:
The institutional review board approved this prospective, randomized, parallel arm design trial. Inclusion criteria consisted of patients 18 years of age and older with a readmission risk score of 25 or greater, and admitted on general medicine floors from November 1, 2022 through February 28, 2023. Patients were randomized into a standard of care (SOC), which received some discharge counseling, or extended SOC group, which received SOC discharge activities completed consistently. The primary outcome was the comparison of composite ED and hospital 30 day readmission rates for patients that have extended pharmacist intervention at discharge versus SOC. Key secondary outcomes included individual rate of ED and hospital 30 day readmissions. The primary outcome was analyzed using chi-squared analysis (alpha < 0.05) and secondary outcomes as descriptive statistics.

Results:
296 patients were included for analysis with 148 patients in either group. Extended SOC decreased the composite 30 day ED visit and hospital readmission rate by 6.7% ($p= 0.63$). Extended SOC group decreased 30 day ED visits by 4.7% and inpatient 30 day readmissions by 7.9%. Extended SOC group had 76 provider accepted recommendations and 9 in SOC group. Extended SOC group had 15 readmissions related to index admission and 12 in SOC group.

Conclusion:
Patients in extended SOC group resulted in a non-statistical decrease in ED visits and inpatient readmissions 30 days after discharge compared to SOC group.

Assessing the impact of a pharmacist-driven remote patient monitoring program utilizing smart devices for adult patients with hypertension or diabetes within a rural health program

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Learning Objectives:

1. Describe the use of remote monitoring and telehealth follow-up strategies for chronic disease state management in the rural setting
2. Identify the relationship between drug and smart device adherence of patients enrolled in a remote patient monitoring program
3. Report the quantity of therapy recommendations given and any changes in clinical parameters from baseline to assess the effectiveness of remote patient monitoring

Purpose:

The purpose of this study is to develop a remote pharmacist ambulatory care patient monitoring program aimed at managing chronic disease states in rural healthcare settings. The program will utilize technology-based monitoring and follow-up telehealth strategies to overcome barriers related to accessibility, health literacy, and affordability. The goal is to achieve positive disease state management outcomes by having pharmacists evaluate the enrolled patients' medications and smart device adherence. Through this approach, the study seeks to reduce hospitalizations and high medical costs by empowering patients to take charge of their own care and providing a proactive intervention strategy for underserved populations.

Methods:

A minimum of 20 patients with pre-diabetes, diabetes, or hypertension will be recruited from the institution's Health Clinic leading the study. Baseline clinical parameters, medication lists, provider information, and additional subjective and objective data will be collected. Retention rates, the relationship between smart device use and medication adherence, and changes in clinical parameters from baseline will be reported using descriptive statistics. Additionally reported will be the number of pharmacist recommendations made to prescribers. Throughout the program, the pharmacist will serve as the principal point of contact for both the patients and providers to bridge existing care gaps.

Results:

Research-in-progress. The project has been awarded an ASHP Foundation Residency Research Grant. There are currently 11 patients enrolled in the program. There are 10 smart glucometer devices received, with 6 still available, and 10 smart blood pressure devices received, with 2 still available. Final results will be presented at the Ohio Pharmacy Residency Conference in May 2023.

Conclusions:

Conclusions will be presented at the Ohio Pharmacy Residency Conference in May 2023.

Evaluation of hyponatremia practices within a community hospital setting

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Learning Objectives:

1. Discuss current guideline-recommended hyponatremia sodium correction strategies for acute hyponatremia.
2. Review data from a community hospital setting regarding use of hypertonic saline for hyponatremia management.

Purpose:

Hyponatremia is an electrolyte disorder defined as sodium levels less than 135 mEq/L, with moderate hyponatremia being sodium levels of 125-129 mEq/L and severe hyponatremia being sodium levels less than 125 mEq/L. Treatment options for moderate-to-severe hyponatremia can include 3% hypertonic saline. Overcorrection of sodium can have many neurological consequences, the most severe being osmotic demyelination syndrome. The primary outcome is the percentage of patients treated for hyponatremia that received appropriate therapy in terms of sodium correction rate, 6-12 mEq/L in the first 24 hours and no more than 18 mEq/L in 48 hours after diagnosis. Secondary outcomes include identifying risk factors for inappropriate sodium correction including physician specialty, use of initial hypertonic bolus, baseline comorbidities, and laboratory monitoring frequency.

Methods:

This retrospective review was approved by the institutional review board. The electronic medical record was used to identify patients who received 3% hypertonic saline during admission at a community healthcare system for the treatment of hyponatremia from June 1, 2021 to May 31, 2022. Patients at least 18 years old, receiving the diagnosis of hyponatremia, identified as a sodium level less than 130 mEq/L, or receiving 3% hypertonic saline will be included in the study. Patients were excluded from the study if they received hypertonic saline for other indications like intracranial hemorrhage or, herniation. Data collection included: initial serum sodium level; comorbidities (adrenal insufficiency, CHF, SIADH, etc.); 3% hypertonic saline bolus vs. infusion; sodium correction at 24- and 48-hours post-diagnosis of hyponatremia; overcorrection management strategies (desmopressin, dextrose); duration of treatment; specialty consulted; and total hospital length of stay.

Results:

Results will be presented at the Ohio Pharmacy Resident Conference.

Conclusions:

Conclusions will be presented at the Ohio Pharmacy Resident Conference.

Expansion of lipid lowering therapy optimization during transitions of care in post-AMI Patients

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UAN: 0048-0000-23-167-L01-P

Learning Objectives:

1. Recall the current guideline recommendations regarding cholesterol management for secondary prevention per ACC/AHA.
2. Describe the impact of pharmacist-led lipid lowering interventions at St. Elizabeth Healthcare

Purpose:

In our community health system, patients diagnosed with an acute myocardial infarction (AMI) are potentially admitted to the Cardiac Short Stay Unit (CSSU). Pharmacists on CSSU optimize AMI patient's lipid lowering therapy (LLT) and upon discharge, refer for pharmacist LLT management in the outpatient setting to ensure optimization. The objective of this study is to expand this optimization from a previously conducted study to additional floors where AMI patients may be admitted. Rates of LDL goal achievement (<70 mg/dL) will be compared in pharmacist led vs. non-pharmacist led optimization.

Methods:

This pre-post study was approved by the institutional review board. Pharmacists covering patients on three additional hospital floors identified eligible AMI patients with an LDL ≥ 70 mg/dL for study inclusion. Patients must also be ≥18 years old and followed by a network provider in the outpatient setting. Comparator data pulled from November 1st, 2018, to December 31st, 2019, with similar inclusion criteria was utilized to compare rates of LDL goal achievement in pharmacist vs. non-pharmacist led intervention. Data collection for both groups included: patient demographics, history of major ASCVD events, patient's high-risk conditions, current lipid lowering therapy agents, lipid panel levels, genetic testing for familial hypercholesterolemia if available, history of ASCVD events, the percentage of referral acceptance from the patient, as well as the St. Elizabeth provider and office location in the outpatient setting. Time from discharge to goal LDL (<70 mg/dL) was compared between groups utilizing a Mann-Whitney test. Pharmacist recommendations for optimization were based on American College of Cardiology and American Heart Association 2018 Guideline on the Management of Blood Cholesterol.

Results:

Data collection and analysis are in process. Results will be presented at the Ohio Pharmacy Resident Conference.

Conclusions:

Conclusions will be presented at the Ohio Pharmacy Resident Conference.

Evaluation of C1 Esterase Inhibitor Therapy on Emergency Department Disposition in Patients with ACE-I Induced Angioedema: A Matched Cohort Study

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Learning Objectives:

1. Describe proposed mechanism of action of C1 esterase inhibitor for the treatment of angiotensin converting enzyme inhibitor associated angioedema.
2. Discuss available literature supporting the use of C1 esterase inhibitor for the treatment of angiotensin converting enzyme inhibitor associated angioedema.

Purpose:

The aim of this study was to evaluate the impact of C1 esterase inhibitor (C1-INH) on discharge disposition of emergency department (ED) patients with angiotensin converting enzyme inhibitor induced angioedema (ACEI-A) compared to patients who did not receive C1-INH.

Methods:

This was a retrospective study of adult ED patients with ACEI-A between January 1, 2018 and November 1, 2022. Patients were excluded if they had angioedema due to another cause, hereditary or acquired angioedema, C1-INH on prior to encounter medication list, or C1-INH was administered outside of the ED. The primary outcome was ED disposition (intensive care unit [ICU] vs non-ICU inpatient/observation, or discharged). Secondary outcomes include ED, ICU and hospital length of stay (LOS), airway intervention, intubation duration, and symptom recurrence.

Results:

A total of 210 patients were screened for inclusion. After exclusion, 148 patients were included in the final analysis, with 74 patients receiving C1-INH and 74 patients serving as control. Baseline characteristics between groups were similar, except patients who received C1-INH were more likely to report Hispanic ethnicity (98.6% vs 4.1%, $p<0.0001$), have a higher initial symptom severity score (3 vs 1, $p <0.0001$), and more likely to have an Anesthesia consult (18.9% vs 10.1%, $p=0.0004$). Patients who received C1-INH were more likely to be admitted to the ICU (66.2% vs 17.6%, $p<0.0001$), require intubation (33.8% vs 4.1%, $p<0.001$), and have a longer hospital LOS (2 vs 1 days, $p=0.0017$). Symptom recurrence was more frequent in patients who received C1-INH (21.9% vs 9.9%, $p=0.0483$).

Conclusions:

Patients who received C1-INH for ACEI-A were more likely to require ICU admission and intubation, and had longer hospitalizations. These results are limited by the potential for selection bias by the treating physician choosing to administer C1-INH and confounded by a higher initial symptom severity score observed in patients who received C1-INH.

Analysis of Guideline Compliance in Crohn's Disease and Ulcerative Colitis Management in a Gastroenterology Clinic

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UAN: 0048-0000-23-169-L01-P

Learning Objectives:

1. Review AGA and ACG guidelines for Crohn's disease (CD) and ulcerative colitis (UC)
2. Evaluate prescribing patterns for immunomodulator, corticosteroid, and biologic drug therapies
3. Discuss opportunities for increased pharmacist involvement and documentation methods in appropriate prescribing practices for UC and CD

Purpose:

Current guidelines for UC and CD recommend a treat-to-target approach for treatment management. Immunomodulator, aminosalicylate, corticosteroid, and biologic regimens are commonly used in patients with UC and CD. However, agents such as tumor necrosis factor (TNF)-alpha inhibitors, proven to be effective in patients with moderate-to-severe disease are commonly used in mild disease, which may lead to risk of adverse effects and high costs that may not be justifiable to use in low-risk population. The purpose of this study was to evaluate the appropriateness of prescribing practices in UC and CD treatment management.

Methods:

This study was a retrospective, single-center, descriptive electronic medical record review of a cohort of patients at UTMC Gastroenterology clinic. All patients who had a most recent prescription for the specified drug classes, including aminosalicylates, immunomodulators, tumor necrosis factor (TNF)-alpha antagonists, interleukin (IL) inhibitors, Janus kinase (JAK) inhibitors, or corticosteroid, sent to University of Toledo (UT) Access Pharmacy between July 1st, 2020 and June 30th, 2022 were eligible for inclusion. Further chart review was conducted for patients who completed laboratory monitoring, disease activity assessments, and pharmacist interventions during the study period.

Results:

Of the ninety-two patients identified to have a written prescription during the study period, sixty-nine patients were included in the study. Forty-eight (69.6%) patients were on appropriate therapy based on guideline recommendations, whereas twenty-one (30.4%) patients were not on guideline-recommended therapy. Of those patients who were on appropriate therapy, twenty-one (43.8%) patients had ulcerative colitis and twenty-seven (56.3%) had Crohn's disease. Of the included patients, thirty-two (46.4%) patients completed all recommended lab monitoring metrics, seventeen (24.6%) patients had documented disease activity metrics, thirty-two (46.4%) patients had documented disease severity, and fifty-six (81.2%) patients had a pharmacist intervention.

Conclusion:

Improvement in documentation and increased pharmacist involvement can play a role in ensuring that CD and UC patients receive proper guideline recommended medication therapy and monitoring to improve disease state specific goals.

Implementation of pilot clinical pharmacist services at a geriatric assessment clinic

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UAN: 0048-0000-23-170-L04-P

Learning Objectives:

1. Describe role and benefit of clinical pharmacist services in geriatric clinics
2. Discuss implementation and perceptions of clinical pharmacist services in geriatric assessment clinic

Purpose:
This study details the implementation of a clinical pharmacist service at a geriatric assessment clinic. Previous studies of pharmacist incorporation into geriatric patient care demonstrated improved therapeutic, safety, hospitalization, and adherence outcomes over standard of care. There is great opportunity and benefit to pharmacist involvement in the care of geriatric patients, and this project explores the expansion of pharmacist services into a single-site geriatric assessment clinic.

Methods:
This is a prospective quality improvement project. The primary aim is to demonstrate the value of the clinical pharmacist with metrics surrounding provided services. Secondary aims include evaluating provider and patient perceptions of clinical pharmacy services. The pilot service included telephonic medication reviews 2-3 days prior to clinic appointment. The pharmacist then communicated identified recommendations to the geriatrician. All results are analyzed and presented as descriptive statistics.

Results:
There were 86 patients included, with an average of 11.35 medications each. Approximately one-third of medication reviews were completed via telehealth and two-thirds via fill history. There were 345 medication list discrepancies found, with an average of 4 per patient. There were 166 recommendations made to geriatricians, with 37.3% implemented at the appointment and 6.6% being forwarded to PCP or another specialist. Limitations included no-shows, differing appointment priorities, and time constraints of patients. Two of the three geriatricians responded to post-intervention survey and results demonstrated that the pilot was well-received.

Conclusions:
Clinical pharmacist services resulted in a significant improvement to medication list accuracy and implemented clinical quality/safety interventions. Geriatricians viewed clinical pharmacist services as beneficial to patients, relevant, and increasing quality of care. This study adds to the literature regarding benefits of pharmacist involvement in the care of geriatric patients and demonstrates impact from both numerical and provider-perceived perspectives.

The impact of antipsychotic polypharmacy on length of stay in patients with schizophrenia

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UAN: 0048-0000-23-171-L01-P

Learning Objectives:

1. Describe current guideline recommendations pertaining to antipsychotic polypharmacy
2. Review the impact of antipsychotic polypharmacy on length of stay in patients with schizophrenia

Purpose:
Current guideline recommendation for new-onset and treatment-resistant schizophrenia endorses a narrow use of antipsychotic polypharmacy. Despite guideline recommendations, antipsychotic polypharmacy remains prevalent in hospitalized patients with schizophrenia. Polypharmacy lacks empirical data for both its safety and efficacy. Therefore, the length of stay will be examined between patients receiving antipsychotic monotherapy versus antipsychotic polypharmacy.

Methods:
Retrospective chart review was conducted on patients admitted to any inpatient behavioral health unit within a multi-site health system. Patients were included if they were 18 years of age or older and having received one or more scheduled antipsychotic medications during their hospitalization. Patients receiving monotherapy (one antipsychotic) versus polypharmacy (two or more antipsychotics) were compared to determine if polypharmacy increased length of stay. Patient specific data collected included BMI, Hemoglobin A1c, and QTc interval. A multivariate analysis was conducted with concurrent psychiatric diagnoses, patient comorbidity, substance use history, placement, and marital status.

Results:
611 patient charts were reviewed and analyzed. 311 patients received monotherapy and 300 patients received polypharmacy during their hospitalization. The average length of stay was higher in patients who received polypharmacy versus those who received monotherapy (17.3 ± 11.4 vs. 9.3 ± 6.4, $p < 0.001$). Length of stay between groups remained statistically significant after the multivariate analysis.

Conclusions:
This study found that polypharmacy was associated with a statistically significant increase in length of stay when compared to monotherapy. Future research is needed to determine the relationship between disease severity and the prevalence of polypharmacy.

Safety and Efficacy of Digoxin Loading Doses in Renal Insufficiency

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Learning Objectives:

1. Review guideline and literature recommendations for digoxin loading dose strategies in patients with atrial fibrillation (AF)/atrial flutter and normal or impaired renal function.
2. Describe the impact of digoxin loading dose strategy on the risk of toxicity in patients with altered renal function.

Purpose:

Varying recommendations exist regarding the optimal dosing strategy for patients receiving digoxin loading doses for rate control. Given the narrow therapeutic index of digoxin and reduced clearance in the setting of renal insufficiency, inappropriate dosing may increase the risk of toxicity, particularly in patients with impaired kidney function. The primary purpose of this study was to evaluate the risk of digoxin toxicity with loading doses in patients with normal versus impaired renal function.

Methods:

This was a single-center, retrospective cohort study evaluating patients who received digoxin loading doses between January 2020 and June 2022 for treatment of atrial fibrillation/flutter or supraventricular tachycardias. The primary outcome was a composite of events correlated with digoxin toxicity, including nausea, vomiting, chromatopsia, arrhythmias, digoxin immune fab use, and electrolyte derangements. Secondary outcomes included in-hospital mortality, rate control, and appropriateness of total loading dose ordered. Descriptive and inferential statistics were used to conduct data analysis.

Results:

Of 736 patients meeting study criteria, a convenience sample of 250 patients were evaluated (95 patients with CrCl ≥ 60 mL/min, 155 patients with CrCl < 60 mL/min). A total of 34 patients with CrCl ≥ 60 mL/min experienced at least one event correlated with digoxin toxicity versus 67 patients with CrCl < 60 mL/min (35.8% vs. 43.2%, p = 0.2844). In-hospital mortality occurred in 12 patients with CrCl ≥ 60 mL/min and 23 patients with CrCl < 60 mL/min (12.6% vs. 14.8%, p = 0.91). Average heart rate 48 hours from digoxin initiation was significantly lower in patients with CrCl < 60 mL/min (92 bpm vs. 85 bpm, p = 0.0039).

Conclusions:

Patients with renal insufficiency receiving digoxin loading doses did not experience a higher rate of toxicity events compared to patients with normal renal function.

Impact of Early vs Late Resumption of Outpatient Behavioral Health Regimens on ICU Outcomes for Mechanically Ventilated Patients

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Learning Objectives:

1. Describe the pathophysiology between abrupt discontinuation of behavioral health medications and withdrawal symptoms
2. Review existing literature looking at the discontinuation of behavioral health medications and the increased prevalence of agitation and delirium in ICU patients

Purpose:
Studies estimate that 19% of Intensive Care Unit (ICU) patients have pre-existing mental health conditions. Upon hospital admission, home medications may be held until deemed appropriate by the medical team. Abrupt discontinuation of behavioral health medications increases risk of withdrawal symptoms and relapse in mental health conditions. Previous research shows an association between pre-existing mental health conditions and poor outcomes like increased hospital length of stay and days on mechanical ventilation. Currently, there's no recommendations on reinitiating home medications in ICU patients. This study aims to evaluate if the time to resumption of behavioral health medications has an impact on length of stay for ICU patients requiring mechanical ventilation.

Methods:
This retrospective study took place across three hospitals within the same health system located in Northwest Ohio and Southeast Michigan from May 1, 2017 to June 30, 2022. Adult patients ≥ 18 years old with a diagnosis of bipolar disorder, schizophrenia, or schizoaffective disorder admitted to the general ICU with documented behavioral health medications on both the home medication list and during the ICU encounter were included. Patients were excluded if they had COVID-19 during the encounter, admitted with a seizure disorder or seizures secondary to the primary complaint, or had a major or minor bleed. Additional exclusion criteria included documented discontinuation or nonadherence to behavioral health medications ≥ 7 days prior to encounter**,** used long-acting injectable antipsychotics, attempted suicide or overdose using behavioral health medications, admitted with a traumatic brain injury or intracranial hemorrhage, documented as deceased ≤ 48 hours of ICU admission, and/or required admission to specialized ICUs.

Results:
1476 patient encounters were screened, 53 patient encounters were included. Data analysis is ongoing and results will be presented at the 2023 Ohio Pharmacy Resident Conference.

Conclusions:
To be presented at the 2023 Ohio Pharmacy Resident Conference.

Lurbinectedin versus Other Agents for the Treatment of Recurrent Small Cell Lung Cancer

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UAN: 0048-0000-23-174-L01-P

Learning Objectives:

1. Review current treatment options for recurrent metastatic small cell lung cancer
2. Discuss the use of lurbinectedin as single agent chemotherapy in the treatment of patients with recurrent metastatic small cell lung cancer

Purpose:
Small cell lung cancer (SCLC) is an aggressive malignancy characterized by rapid recurrence and limited options for second line treatment. Lurbinectedin is an alkylating agent that received an accelerated approval from the FDA in June 2020 for the treatment of recurrent metastatic SCLC. However, current literature lacks head-to-head comparative data between lurbinectedin and other single-agent treatment options. This study aimed to evaluate clinical outcomes for patients with recurrent SCLC who received lurbinectedin compared to available single-agent treatment options in the second-line setting.

Methods:
This study was a retrospective, multi-center, chart review of patients who were treated for recurrent SCLC. Adults (aged ≥18 years) with SCLC that had documented disease progression on or within 6 months of treatment with a platinum-containing regimen and subsequently received treatment with either lurbinectedin, topotecan, paclitaxel or irinotecan at a network facility were included in the study. The primary outcomes include overall survival (OS), progression-free survival (PFS), and duration of response. Secondary outcomes include hematological toxicities, incidence of emergency department visits and hospitalizations, and incidence of treatment delay. All patients who meet inclusion criteria were evaluated for efficacy and safety.

Results:
A total of 54 patients met inclusion criteria (18 lurbinectedin and 25 other agents). Median OS was 8.4 months in the lurbinectedin group and 3.8 months in other agents (p=0.002). Median PFS was 4.6 months in the lurbinectedin group and 2.1 months in other agents (p=0.002). Median duration of response was 2.19 months vs 1.53 months, respectively (p=0.006). No significant differences were seen in hematological toxicities or other safety outcomes.

Conclusions:
In conclusion, results from this study support the use of lurbinectedin as a single agent chemotherapy option for patients with recurrent SCLC. With demonstrated benefits in survival and a comparable safety profile, lurbinectedin can be a valuable treatment option in the second-line setting.

Nonsterile Compounding Implementation at an Independent Community Pharmacy in Rural Ohio

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Learning Objectives:

1. Develop a training program for pharmacists, interns, and technicians, consistent with United States Pharmacopeia (USP) 795 guidelines, that promotes legal compliance and sustainability.
2. Educate or provide consultation to at least ten prescribers, including veterinarians, on the benefits of compounding that can transcend dependence on limited commercially available products.
3. Establish a mechanism for prescribers and patients to provide feedback regarding this service.

Purpose:

The primary objective is to evaluate the implementation of a sustainable practice of nonsterile compounding within the Ohio Northern University (ONU) Healthwise Pharmacy. The community pharmacy is located in a rural, underserved area where one-third of adults have no car. This effort is vital to improve medication access for human and veterinary patients, as the closest compounding pharmacy is over 45 miles.

Methods:

This project is the evaluation of a business plan to implement a nonsterile compounding program at an independent community pharmacy in a rural, underserved area. The initial steps of the plan involved developing standard operating procedures including legal guidelines, pricing rules, and comprehensive training of the investigator in nonsterile compounding for human and veterinary patients. Comprehensive training included legal considerations, software use, skills training based on compound type, and proper documentation procedures created for pharmacists, technicians, and interns. A cost-effective supplier was chosen and an initial inventory was based on a community needs assessment. In order to identify the needs of the community, marketing strategies were formulated to promote the service by educating prescribers about the array of compounded products to enhance their patient care. A survey was created to assess qualitative data from prescribers, patients, and animal owners who use the service. Evaluation of the business model will include the survey results from prescribers in addition to staff and student feedback via focus groups after implementation. Measures will be used to evaluate compliance with USP and legal requirements for each compound as part of quality improvement. Key components from the implementation process including survey and focus group feedback will be compiled to provide insight to other pharmacists interested in establishing nonsterile compounding services.

Results: The most significant barriers to implementation were cost, training, and standardization. Standardization was achieved through detailed standard operating procedures (SOP) that were reviewed in training. Training was created based on USP 795 guidance. Cost was overcome by the pharmacy. Though implementation was successful, there was only one compound made to date.

Conclusions: Will be presented at the OPRC meeting.

Impact of potassium salt formulations in conjunction with diuresis on the incidence of alkalosis in the intensive care unit

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Learning Objectives:

1. Discuss the concerns of exogenous bicarbonate administration in critically-ill patients receiving diuresis
2. Identify the impact of utilizing potassium bicarbonate over potassium chloride for enteral potassium supplementation in critically-ill patients receiving diuresis

Purpose:
Critically ill patients within the intensive care unit (ICU) commonly receive diuresis and oral potassium supplementation. Alkalosis is a common adverse effect of diuretic administration. There is concern exogenous potassium bicarbonate may increase the overall incidence of alkalosis compared to patients who received potassium chloride. Current evidence suggests a serum bicarbonate greater than 30 mEq/L is associated with an increased ICU length of stay (LOS) and increased risk of in-hospital mortality. This study aims to evaluate the incidence of alkalosis in patients undergoing diuresis who received potassium bicarbonate or potassium chloride as part of their preferred enteral potassium supplementation

Methods:
This was a retrospective cohort analysis characterizing the effect of potassium bicarbonate on the incidence of alkalosis in intensive care unit (ICU) patients receiving diuresis. Patients aged 18 years or older were included if they were admitted to the ICU for a minimum of 48 hours between either January 1, 2019 to June 30, 2019 or September 1, 2019 to February 29, 2020 and received a loop diuretic as well as potassium supplementation within 24 hours of one another. Patients who were pregnant, received renal replacement therapy, or parenteral nutrition at any time during hospitalization were excluded. The primary endpoint was the incidence of a serum bicarbonate greater than 30 mEq/L.

Results:
A total of 563 patients were included in the final analysis. A serum bicarbonate greater than 30 mEq/L occurred in 77 of 450 patients (17.1%) in the potassium chloride group and in 43 of 113 patients (38.1%) in the potassium bicarbonate group (p-value < 0.001). The potassium bicarbonate group experienced a greater frequency of invasive ventilatory support and mortality, as well as a prolonged in-hospital LOS.

Conclusions:
The utilization of potassium bicarbonate resulted in a greater incidence of developing a serum bicarbonate greater than 30 mEq/L, in-hospital LOS, and mortality.

Evaluation of a Pharmacist's Role in a Complex Outpatient Antimicrobial Therapy (COpAT) Program Within an Outpatient Clinic

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Learning Objectives:

1. Discuss the interventions and impact a clinical infectious disease pharmacist can make in a complex outpatient antimicrobial therapy (COpAT) program.
2. Review the literature of pharmacist presence in a COpAT program.

Purpose:

The Mercy Health Infectious Disease Clinic started a complex outpatient antimicrobial therapy (COpAT) program in June 2022. The COpAT program consists of an interdisciplinary team of physicians, nurses, and a pharmacist. Historically, COpAT programs have been physician led. With the need for expanding services, the role for a clinical infectious disease pharmacist in this setting continues to grow. The objective of this study is to evaluate a pharmacist's role at our clinic and review the interventions made by a pharmacist to improve patient care.

Methods:

This is a retrospective chart review of patients being treated with antimicrobial agents through a newly established COpAT program at Mercy Health Infectious Disease. All patients 18 years or older who were referred to the COpAT program between June 1, 2022, and November 30, 2022, were included, if they had received at least one of the four commonly utilized antibiotics. These antibiotics include intravenous vancomycin, daptomycin, ertapenem, and oral linezolid. Patients will be identified through a report ran from COpAT referrals in the electronic health record (EHR). The primary outcome is to describe all interventions a clinical infectious disease pharmacist makes. Secondary outcomes include time to intervention, provider satisfaction, and incidence of adverse effects.

Results:

A total of 407 patient charts were reviewed. During the 6- month period of this study, the clinical infectious disease pharmacist made a total of 75 interventions on 57 patients. There were 42 interventions (56%) made on vancomycin, 6 interventions (8%) made on ertapenem, 22 interventions (29%) made on daptomycin, and 5 interventions (7%) made on linezolid. The average time to intervention for vancomycin was 8 days, ertapenem was 12.5 days, daptomycin was 4.5 days, and linezolid was 22 days.

Conclusion:

The ID clinical pharmacist made a total of 75 interventions upon reviewing patient regimens that included intravenous vancomycin, ertapenem, daptomycin, and oral linezolid from June 1, 2022, through November 30, 2022.

Analysis of blood pressure management post-alteplase administration for treatment of an acute ischemic stroke

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Learning Objectives:

1. Identify common adverse reactions that can occur after alteplase administration for treatment of acute ischemic stroke (AIS).
2. Recall the guideline-recommended blood pressure goals associated with improved patient outcomes.

Purpose:

The purpose of this study is to assess the number of blood pressure excursions and time spent above the American Heart Association/American Stroke Association (AHA/ASA) blood pressure goal range for the first 24 hours post-alteplase administration for AIS, along with the effects those excursions may have on patient outcomes.

Methods:

The study was approved by the Institutional Review Board. The electronic medical record was utilized to identify all patients admitted from July 1, 2019, to July 31, 2022, who received alteplase for treatment of AIS. Patient demographics, National Institutes of Health Stroke Scale scores (NIHSS), Glasgow Coma Scale (GCS) scores, health status, systolic and diastolic blood pressure measurements, medical history, type of ischemic stroke, and adverse events were obtained via manual chart review. A blood pressure excursion is any blood pressure reading above the AHA/ASA guideline-recommended maximum pressures of 180 mmHg systolic or 105 mmHg diastolic for 24 hours post-alteplase for treatment of AIS. Such excursions may be associated with poor patient outcomes. All data was recorded without patient identifiers. Patient outcomes were measured by analysis of recorded NIHSS score change >4 and GCS score change >2; both taken as change from baseline at pre-alteplase administration. Safety analysis and individual components of the primary outcome were also compared in patients with at least one blood pressure excursion to those without.

Results:

Results of this study will be presented at the Ohio Pharmacy Resident Conference.

Conclusions:

Conclusions will be presented at the Ohio Pharmacy Resident Conference.

Impact of SGLT2 inhibitor initiation on diuretic adjustment and renal safety in hospitalized patients with heart failure

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UAN: 0048-0000-23-179-L01-P

Learning Objectives:

1. Discuss the available evidence for use of SGLT2 inhibitors in the inpatient setting
2. Review the safety profile of dapagliflozin in a hospitalized patient cohort

Purpose:
Data from inpatient initiation of SGLT2 inhibitors (SGLT2i) has shown increased urine output and reduction in worsening heart failure (HF), rehospitalization, and death. This study aims to determine the impact of timing of dapagliflozin initiation on length of stay (LOS) in patients admitted with HF.

Methods:
This IRB-approved retrospective cohort study included patients admitted to a single institution with HF from May 2021 to September 2022 who required IV diuretics for at least two days and received at least one dose of dapagliflozin. Early initiation of dapagliflozin during the acute diuresis phase, characterized as at least two calendar days of overlap between dapagliflozin and IV diuretics, was compared to late initiation, which was defined as after the acute diuresis phase with one or less days of overlap.
The primary outcome was LOS. Secondary outcomes included time to diuretic de-escalation, need to re-initiate IV diuretics before discharge, renal safety, genitourinary infection risk, and 30-day all-cause readmission, mortality, or admission to hospice. Data was analyzed with the Mann-Whitney U, $\chi 2$, or Fisher exact test as appropriate.

Results:
There were 63 patients in the early initiation group and 66 in the late initiation group. More patients in the early initiation group were female; all other baseline characteristics were similar. Median LOS was 6.83 and 6.17 days in the early and late initiation groups, respectively (p=0.691). The early initiation group had a longer time to diuretic de-escalation: 98 hours compared to 68 hours (p=0.032). There were no significant differences in other secondary outcomes.

Conclusions:
There was no significant impact on LOS based on timing of initiation of dapagliflozin. It is possible that selection bias was involved, as patients that were more fluid overloaded could have been more likely to start an SGLT2i earlier. Further studies to investigate timing of initiation would be valuable.

Pharmacist Impact on Diabetes Prevention in Newly Diagnosed PreDiabetic Patients in a FQHC Setting

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Learning Objectives:

1. Discuss recommendations for newly diagnosed prediabetes to prevent progression to diabetes.
2. Recognize the impact pharmacist can have on patients with newly diagnosed prediabetes

Purpose:
Prediabetes education provided to newly diagnosed prediabetics can impact patient perception of diabetes and how lifestyle modifications can slow or reverse the progression to a diagnosis of diabetes. Type 2 diabetes affects approximately 8% of adults in the United States while two-thirds of the US population has prediabetes. The intent of this research is to provide education to newly diagnosed prediabetics to determine if the education provided by clinical pharmacists has an impact on future Hemoglobin A1C (A1C) readings.

Methods:
This study is a retrospective chart review to determine the impact clinical pharmacists had on patient with prediabetes A1cs within our institution from June 2022 to January of 2023. Patients were included who were 18 years of age or older and had a new diagnosis of prediabetes with an A1c of 5.7%-6.4%.The primary outcome of this study was to determine the impact education had on subsequent A1c's of patients who came to appointments with a clinical pharmacist compared to those who did not.. Secondary outcomes looked at weight reductions within this patient population.

Results:
48 total patients met criteria for the study (39 patients in the treatment group who received education compared to 9 patients who did not) from a total of 342 total patients pulled. Overall there was not a statistically significant change in A1C compared between the two groups at baseline (p=0.829) or 6 months after baseline (p=0.789). There was also no statistically significant difference between groups for weight loss.

Conclusions:
The results from our study were limited due to lack of follow up or repeat A1C within the time frame of the study. Patients who participated in educational appointments were more likely to get a repeat A1C within the study time frame compared to those who did not. Further studies are needed to be completed to determine impact clinical pharmacists have on subsequent A1cs with longer study duration and ensuring repeat A1cs.

Evaluation of the use of Leapfrog's gold standard medication reconciliation audit process at a large community hospital

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Kristi Ziegenbusch, PharmD; Lisa Brady, PharmD, MBA

UAN: 0048-0000-23-181-L04-P

Learning Objectives:

1. Describe the Leapfrog Hospital Survey Section 8B regarding the measure of medication reconciliation.
2. Recognize the pharmacist's role in improving medication reconciliation practices to facilitate the reduction of medication discrepancies.

Purpose:

Measures have been developed to assess medication reconciliation practices. The Leapfrog Hospital Survey assesses hospital performance on national measures of safety, quality, and efficiency of care, and endorses a Medication Reconciliation measure within the medication safety section of the survey. The purpose of this retrospective chart review is to evaluate the pharmacist use of Leapfrog's gold standard medication reconciliation audit process and report the rate of unintentional medication discrepancies for patients admitted to Mercy Health St. Rita's Medical Center (SRMC) compared to national standard set forth by Leapfrog.

Methods:

This was a single center, retrospective chart review of inpatient medical records. After medication reconciliation was performed by nursing, pharmacists completed Leapfrog's gold standard medication reconciliation audits for each sampled patient. The study included patients eighteen years and older admitted to St. Rita's Medical Center taking at least one gold standard medication prior to admission with a medication history completed by nursing. The study excluded patients younger than eighteen years old, patients transferred from an outside hospital, patients admitted with an "observation status", patients with a length of stay less than one day, any patient admitted to a labor and delivery unit, and any patient admitted to a rehab unit. The primary outcome of this study was to evaluate the rate of unintentional medication discrepancies.

Results:

Final results to be presented.

Conclusions:

Final conclusions to be presented.

VTE Prophylaxis Education in a Community Hospital to Reduce Incidences of Deep Vein Thrombosis and Pulmonary Embolism in the Post-Op General Surgery Population

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UAN: 0048-0000-23-182-L01-P

Learning Objectives:

1. Review local prescribing habits surrounding post-operative VTE prophylaxis
2. Identify opportunities to improve practices in accordance to available medical literature and guideline recommendations in the surgical population

Purpose:

Current data shows that risk of venous thromboembolisms (VTE) are heightened following general surgical procedures. Administration of VTE prophylaxis with low molecular weight heparin or low dose unfractionated heparin remains the consensus guideline recommendation. The purpose of this quality improvement initiative was to provide education to providers on best practices to decrease number of thromboembolic events in post-surgical patients at a local community hospital.

Methods:

This was a single-centered, observational, quality improvement project that evaluated post-operative VTE prophylaxis in patients 18 years and older who underwent general surgery at University Hospitals Ahuja Medical Center. Patients were excluded if they underwent orthopedic or podiatry procedures, or if they were on therapeutic anticoagulation prior to surgery. The initial phase reviewed current available literature and local surgeon preferences to determine best practices for post-operative VTE prophylaxis. Following evaluation, development of a “Best Practice Recommendations” reference tool was created and education on this tool was provided to surgical services and nursing staff. Prospective chart audits were conducted from February 20, 2023 to March 20, 2023 to determine if recommendations were followed. If deviations from best practices were identified, providers were contacted and recommendations based on the reference tool were provided. The primary endpoint assessed was the number VTE events over the course of the month. Secondary endpoints included post-operative DVT risk assessment completion rates, evaluation of chemoprophylaxis dosing based on patient specific factors, timing of chemoprophylaxis initiation, mechanical prophylaxis compliance, and medication adherence.

Results:

A total of 103 cases were included in the data analysis. The primary endpoint occurred in <1% of cases (1/103), while 79% (81/103) of cases followed recommendations based on the “Best Practice” reference tool.

Conclusion:

Further discussion of the results and statistical analysis will be presented at the 2023 Ohio Pharmacy Residency Conference.

GLP-1 Receptor Agonists: Safety and Efficacy Differences in a Real-World Population

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UAN: 0048-0000-23-183-L05-P

Learning Objectives:

1. Review the side effects, administration, and place in therapy of Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) in the treatment of diabetes mellitus
2. Differentiate safety and efficacy between GLP-1 RAs in a real-world setting

Purpose:
The safety and efficacy between GLP-1 RAs are accepted, but not thoroughly studied. While there are some head-to-head studies for GLP-1 RAs, there are no studies that review more than two GLP-1 RAs at once. In addition, these studies did not consider safety and efficacy differences that could arise from varying social determinants of health. The purpose of this study was to assess the safety and efficacy of long-acting injectable GLP-1 RAs in a real-world underserved population.

Methods:
A retrospective chart review was done of patients 18 years and older with diabetes who were prescribed injectable semaglutide, liraglutide, dulaglutide, or exenatide extended release (ER) by a MetroHealth (MH) provider between January 1st, 2018-September 1st, 2022. The primary end point was percent change in A1c from baseline to 6 months and secondary endpoints evaluated changes in A1c at 12 months, discontinuation rates, emergency department visits, weight, renal function, blood pressure, and mortality.

Results:
A total of 9,402 participants were included. Average age was 55.4 years with 60.9% female and 45% African American. Amongst the participants, 2,547 were prescribed dulaglutide, 166 prescribed exenatide ER, 2,486 prescribed liraglutide, and 769 prescribed semaglutide. Baseline A1c values were 9.07, 9.03, 8.94, and 8.51 respectively. From baseline to 6 months there was an A1c change of -1.07, -0.36, -0.84, and -0.90 ($P = <0.001$) and from baseline to 12 months 0.90, 0.23, 0.64, and 0.86 ($P = <0.001$) respectively. There were weight reductions in all cohorts. There was no significant difference regarding creatinine, microalbumin, or eGFR.

Conclusions:
In a real-world underserved population dulaglutide had the largest reduction regarding both A1c and weight. This study provides practitioners with additional information regarding potential differences between long-acting GLP-1 RAs and made it evident that additional head-to-head GLP-1 RA studies should be conducted as additional GLP-1 RAs are brought to the market.

Identification of Cancer Treatment Delays and Prevention Strategies in a Rural Outpatient Setting

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Learning Objectives:

1. Identify common causes of chemotherapy treatment delays.
2. Determine prevention strategies to help mitigate identified treatment delays.

Purpose:

Early detection and prompt treatment of cancers are paramount in limiting cancer progression and providing patients a curative intent. Common delays to the initiation of cancer treatment include lack of insurance, prior authorization denials, delays in laboratory tests, transportation issues, lack of child or adult care, work obligations, and diminished financial and health literacy. Identifying patient specific barriers early and addressing them to eliminate the aforementioned delays is pivotal to ensure timely initiation of cancer treatment. The purpose of this study is to identify common barriers that delay cancer treatment initiation and to determine possible prevention strategies to limit treatment delays.

Methods:

This retrospective review was conducted at University Hospitals Seidman Cancer Center at Firelands Regional Medical Center. Patient charts were reviewed from January 2020 through December 2021 and first-time patients receiving cancer treatment through any route of administration were included in the study. Patients who opted to receive their treatment at another facility and patients under the age of 18 were excluded from the study. Information regarding treatment delays were obtained from the chart reviews and were assessed and categorized. Prevention strategies to address identified delays were determined with plans of implementation in the future. The primary outcome that was evaluated is average time to cancer treatment initiation. Secondary outcomes that were assessed will be types of delays in therapy and types of chemotherapy regimens with treatment delays.

Results:

Results from this study will be presented at the Ohio Pharmacy Residency Conference in May 2023.

Conclusions:

Conclusions from this study will be presented at the Ohio Pharmacy Residency Conference in May 2023.

Safety and Efficacy of Two Hydrocortisone Dosing Regimens in Patients Managed for Septic Shock

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Learning Objectives:

1. Describe the rationale for utilizing corticosteroids and review current guideline recommendations in patients with septic shock.
2. Assess the effect of two intravenous hydrocortisone dosing regimens on cumulative time of exposure to vasopressor therapy.
3. Delineate differences in efficacy or safety outcomes between tapering vs no-tapering dosing regimens for corticosteroid discontinuation.

Purpose:
The 2021 Surviving Sepsis Campaign Guidelines provide a weak recommendation for intravenous corticosteroids, such as hydrocortisone, in the management of patients with septic shock and an ongoing requirement for vasopressor therapy. However, the hydrocortisone dose and frequency that optimizes maximal benefit while minimizing adverse effects has not been identified. This study compared two intravenous hydrocortisone regimens, 50 mg every 6 hours (low-dose) and 100 mg every 8 hours (high-dose) to assess differences in efficacy and safety outcomes.

Methods:
Data collection for this IRB approved, single-center study was conducted via retrospective chart review of adult patients admitted to the hospital between June 1st, 2017 and June 30th, 2022 and received a full days-worth of one of the hydrocortisone regimens. The primary efficacy outcome was vasopressor free days up to day 28 following ICU admission. The primary safety outcome was frequency of adverse effects, including hyperglycemia, gastrointestinal bleeding, hypernatremia, and superinfection.

Results:
A total of 63 patients were included in the analysis, with 43 patients in the low-dose group and 20 patients in the high-dose group. Vasopressor free days up to day 28 between the low-dose and-high dose group was 8.1 vs 7.4 days respectively (p=0.78). No differences in the incidence of adverse effects was found between the groups. In a subgroup analysis assessing the effects of tapering of hydrocortisone prior to discontinuation vs no tapering, vasopressor free days up to 28 days was higher (12.9 vs 6.1 days, p=0.01) in the tapering group compared to the no-tapering group.

Conclusions:
Choice of hydrocortisone dosing regimen had no effect on vasopressor free days up to day 28 or incidence of adverse effects. However, patients who had their hydrocortisone regimen tapered prior to discontinuation had more vasopressor free days up to day 28 compared to patients who didn't have their regimen tapered.

Implementation of a Pharmacy Learner-Driven Inpatient Diabetes Education Service at a Community Hospital

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Learning Objectives:

1. Review the Board for Diabetes Care and Education (CBDCE) requirements for diabetes counseling
2. Identify opportunities for pharmacist coordinated discharge planning and education
3. Evaluate the implementation and role of pharmacist led diabetes education services

Purpose:

Glycemic control in patients with type 2 diabetes mellitus is a continuous effort between pharmacy, medicine, nursing, and nutrition services. Inpatient diabetes education services are generally managed by certified diabetes educators or registered nurses, however in a community hospital these services are not always available. Blanchard Valley Hospital is a 150-bed community hospital located in Findlay, Ohio with the benefit of two accredited colleges of pharmacy within 20 miles. The Accreditation Council for Pharmacy Education (ACPE) requires PharmD candidates to have at least 1,440 hours of experiential education completed before graduation. With the requirement, and the proximity to pharmacy colleges, Blanchard Valley Hospital is able to provide a unique hands on education to a multitude of soon-to-be pharmacy professionals. This project will therefore look at the results and impact of a pharmacy learner driven inpatient diabetes education service on 90 day readmission rates for patients.

Methods:

This study will be submitted to the Blanchard Valley Health System Institutional Review Board for approval. This service and evaluations will be facilitated by a PGY1 pharmacy practice resident, internal medicine clinical pharmacists and pharmacy clinical coordinator. A retrospective chart review will take place on patients admitted to the hospital from March 2022 to June 2022 with an A1c ≥ 8.5% to determine their 90 day readmission rate. This chart review will include patient demographics, A1c levels, discharge medications, outpatient follow up, and repeat A1c levels after admission as available. This process will be repeated, in patients who received the pharmacy led service during an admission between November 2022 and January 2023. Patients enrolled into the service must be 18 years or older, have a laboratory confirmed A1c ≥ 8.5%, admitted at Blanchard Valley Hospital, and are able to be educated. Patient education will include introduction of diabetes, diet and exercise for diabetic patients as well as medication education. The medication education will be tailored to the patient's specific pharmacologic and non-pharmacologic needs with the student pharmacists given education and materials for the selected patients. At the conclusion of this study, a comparative analysis will take place between patients who did not receive diabetes education and those who did.

Results:

The service has been implemented. Data is currently being collected and analyzed.

Conclusions:

Results and conclusion will be presented at the 2023 OPRC Pharmacy Residency Conference.

Inpatient Medication Optimization of Systolic Heart Failure

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Learning Objectives:

1. Evaluate different aspects of the patients' hospital stay and how they affect optimization of guideline directed medical therapy (GDMT).
2. Assess different aspects of the patients' hospital stay on the rate of transitioning diuretics from intravenous (IV) to oral (PO) route at least 24 hours prior to hospital discharge.

Purpose:

Optimization of GDMT in heart failure (HF) with reduced ejection fraction (EF) is important to reducing mortality and risk of future hospitalization for exacerbations. The hospital setting offers a controlled environment in which to initiate or titrate GDMT, but the rate at which this is accomplished is unknown at our organization. The objective of this study was to evaluate current HF optimization rates during hospital stays.

Methods:

Adult patients with reduced EF with an admission to a Mount Carmel hospital for heart failure exacerbation between 11/1/21-11/1/22 were included. The primary outcome was the rate of GDMT optimization based on various factors. The secondary outcome was the rate of transitioning diuretics from IV to PO at least 24 hours prior to discharge.

Results:

442 patients met criteria for this study. 284 (64.25%) received some form of GDMT optimization, the majority of which 246 (55.7%) had at least one GDMT drug added. Patients with cardiology consult were more likely to have GDMT optimization (OR 4.78 (2.21-10.31)) while increased serum creatinine and age were associated with a lower chance of GDMT optimization (for each SCr 1 point increase, OR 0.81 (0.7-0.94); for each 1-year increase in age, OR 0.98 (0.97-0.99)). Among the secondary outcomes, 136 (79.5%) had IV diuretics converted to PO $\geq$24 hours before discharge. For patients not receiving GDMT optimization (n=71), 55 (77.5%) had IV diuretics converted to PO $\geq$24 hours before discharge (p=0.7312). The only factor that impacted IV to PO was CrCl, with higher CrCl patients more likely to NOT have IV to PO 24 hours prior to discharge.

Conclusions:

Cardiology consultation showed to be a major factor in optimization of therapy, making patients approximately five times more likely to receive GDMT optimization. Elderly patients with renal function decline were the least likely to be optimized.

Analyzing 7 and 30-day readmission rates in adults hospitalized for vaso-occlusive crisis

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Learning Objectives:

1. Review epidemiology and pathophysiology of sickle cell disease (SCD) and vaso-occlusive crisis (VOC)
2. Discuss current guideline recommendations for management of VOC pain
3. Describe potential risk factors for readmission related to VOC

Purpose:

OhioHealth identified an increase in VOC-related readmissions. Literature has confirmed patients with SCD experience higher rates of readmission in comparison to the general population; however, there is limited literature evaluating readmission risk factors.

Methods:

This study is a retrospective analysis of electronic medical records of adults with VOC-related admissions at RMH or GMC between May 1, 2018 and May 1 2022. The primary aim is to identify 7 and 30-day readmission rates. The secondary aim is to identify risk factors for readmission. Subjects were identified via an existing OhioHealth database and reviewed by delegated study staff.

Results:

Potential protective factors for 7-day readmission rates include utilization of PCA (OR = 0.81), parenteral opioid ≥ 48 hours (OR = 0.48), and length of stay ≥ 48 hours (OR = 0.56). Potential protective factors for 30-day readmission rates include opioids available at discharge (OR = 0.90), duration of parenteral opioid ≥ 48 hours (OR = 0.74), and length of stay ≥ 48 hours (OR = 0.48). Patients who received parenteral opioids ≤ 3 hours (OR 2.22) may be at an increased risk of readmission within 7 days.

Conclusion:

Duration of parenteral opioids and LOS ≥ 48 hours likely allows for greater pain control and may contribute to decreased rates of readmission at 7 and 30 days. It is unlikely that administration of parenteral opioids ≤ 3 hours is a true risk factor for readmission within 7 days; however, more prompt administration of parenteral opioids upon admission (such as ≤ 1 hour, as outlined in clinical guidelines) may allow quicker pain control and therefore decreased rates of readmission. Pharmacists can play a beneficial role in decreasing VOC-related readmissions by encouraging prompt administration of parenteral opioids, appropriate ordering of parenteral opioids, and ensuring patients are equipped with adequate opioids prior to discharge.

Addition of mineralocorticoid receptor antagonist versus sodium-glucose cotransporter-2 inhibitor to backbone therapy for heart failure with reduced ejection fraction

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Learning Objectives:

1. Discuss the efficacy and safety of mineralocorticoid receptor antagonists (MRA) versus sodium-glucose cotransporter-2 (SGLT-2) inhibitors in patients with heart failure with reduced ejection fraction (HFrEF)
2. Describe the current prescribing patterns in HFrEF management
3. Identify potential barriers to initiation of SGLT-2 inhibitors in patients with HFrEF

Purpose:
Mineralocorticoid receptor antagonists (MRAs) have proven morbidity and mortality benefits in patients with heart failure with reduced ejection fraction (HFrEF). Recent randomized controlled trials (DAPA-HF and EMPEROR-REDUCED) also demonstrated that sodium-glucose cotransporter-2 (SGLT-2) inhibitors improve renal outcomes and provide mortality benefits in patients with HFrEF with or without type 2 diabetes. The purpose of this study will compare the effectiveness of SGLT-2 inhibitors alone versus MRAs alone in patients with heart failure with reduced ejection fraction. The results of this study may provide more information regarding the use of SGLT-2 inhibitors in HFrEF management.

Methods:
This retrospective cohort study will include adult patients (18 years or older) with left ventricular ejection fraction ≤ 40% and admitted to the University of Toledo Medical Center with a primary diagnosis of heart failure from January 1st, 2020, to April 30th, 2022. Patients will be excluded if they were on SGLT-2 inhibitor or MRAs prior to the diagnosis of HFrEF for any medical reasons, type 1 diabetes, eGFR < 30 mL/min/1.73m2, or pregnant. In addition to GDMT beta-blocker and ACEi/ARB/ARNI, patients would be on SGLT-2 inhibitor only, MRA only, or both SGLT-2 inhibitor and MRA across three study groups. The primary outcome will assess the number of unplanned hospitalizations or urgent visits due to worsening heart failure within 30 days. The secondary outcome will assess the number of unplanned hospitalization or urgent visits due to worsening heart failure in 3 months, all-cause mortality, all-cause readmission, all-cause cardiovascular-related death, and adverse events.

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

Conclusions:
Results will be presented at the Ohio Pharmacy Resident Conference.