Evaluating the effect on total daily insulin dose in adult patients with type 1 diabetes managed with metformin and/or GLP-1 or GLP-1/GIP receptor agonists

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UAN: 0048-0000-24-008-L01-P

Learning Objectives:

1. Review the literature surrounding the use of non-insulin therapies in the treatment of type 1 diabetes
2. Identify the effect of adding non-insulin therapies to standard insulin therapy on total daily insulin dose requirements in adult patients with type 1 diabetes

Purpose:
Few studies have assessed the utility of metformin and glucagon-like peptide-1 receptor agonists (GLP-1 RA) in type 1 diabetes (T1D). Available studies theorize that these agents may decrease total daily insulin requirement and increase insulin sensitivity. Limited data exist on the use of the novel dual glucagon-like peptide-1/glucose-dependent insulinotropic polypeptide receptor agonist (GLP-1/GIP RA) or using both metformin and GLP-1 RA or GLP-1/GIP RA in the same patient with T1D. The objective of this study was to evaluate the effect of this growing practice on glycemic control.

Methods:
This was a single-center, retrospective cohort study evaluating adult patients with T1D who received standard insulin therapy plus the following non-insulin therapies for at least 3 months: metformin; GLP-1 RA (semaglutide; dulaglutide) or GLP-1/GIP RA; or metformin and a GLP-1 RA or GLP-1/GIP RA (combo group) between April 1, 2021, and February 28, 2023. Data points were collected on the day of starting the first non-insulin agent, on the day of starting the second non-insulin agent (if applicable) and at the first follow-up office visit at ≥ 3 months on maximum tolerated dose of non-insulin therapy. The primary endpoint was the change in total daily insulin dose. The secondary endpoints were change in A1c and change in weight.

Results:
Of the 336 patients reviewed, a total of 110 patients were included in the study. The change in average insulin total daily dose (TDD) was +4.06 units, -5.9 units and -6.9 units for the metformin, GLP-1RA or GLP-1/GIP RA, and combo groups respectively (P=0.013). TDD after addition of non-insulin therapies decreased by an average of 3.54 units (P=0.02). There was no statistically significant difference in change in A1c between the 3 treatment groups (-0.29%, -0.76% and -0.32%; p=0.203). Addition of non-insulin therapies resulted in an average A1c decrease of 0.62% (P<0.05). Change in average weight was -0.53 kg, -5.15 kg, and -1.18 kg for the metformin, GLP-1RA or GLP-1/GIP RA, and combo groups respectively (P=0.01). Addition of non-insulin therapies resulted in an overall decrease of 3.8 kg in average body weight (P<0.05). Patient-reported hypoglycemia was seen in 76% of patients after addition of non-insulin therapies (P = 0.009).

Conclusions:
The addition of non-insulin therapies to standard insulin therapy in the treatment of type 1 diabetes resulted in improvement in insulin requirement, glycemic control, and body weight in the studied population. Further prospective studies are warranted to validate the results of this study.

Implementation and Evaluation of a Medication Loss Prevention Protocol in a Rural Community Hospital

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Learning objectives:

1. Explain the implementation of a new protocol that standardizes the process of sending, receiving, and storing medications on patient care units.
2. Review the impact of the new protocol on pharmacy department workflow and associated costs.

Purpose:

The purpose of this study is to implement a medication loss prevention protocol and evaluate the resulting effect on pharmacy workflow and the associated financial impact.

Methods:

At Firelands Regional Medical Center, medications for patient use are stored in automated dispensing cabinets (ADC's) located on all patient care units, hand delivered to the units by pharmacy staff, and/or sent via the pneumatic tube system. This was a prospective implementation study conducted to standardize the process of sending, receiving, and storing medications in the main hospital patient care units. Pre-implementation data collection occurred from November 1st, 2023 through November 30th, 2024. Post-implementation occurred from January 15th, 2024 through February 11th, 2024. Pharmacy department personnel recorded the number of phone calls received regarding missing medications, how long each call lasted, and general categories of requested medications that had to be remade and sent to the patient care units. All other calls received by the pharmacy were excluded. The primary outcome evaluated the total pharmacy staff time taken to process missing medication requests. Secondary outcomes included the total cost of staff time spent re-dispensing missing medications (in terms of lost productivity) and the most common missing medication categories requested.

Results:

Before protocol implementation, the inpatient pharmacy received 125 calls regarding missing medications, which required 418-950 minutes per month to process. Post-protocol implementation, the inpatient pharmacy received 45 calls regarding missing medications, which took 160-340 minutes per month to process. Overall, this resulted in a 64% reduction in the number of calls the pharmacy department received regarding missing medications.

Conclusion:

The implementation of a standardized medication loss prevention protocol resulted in a reduction in missing medication phone calls, pharmacist and pharmacy technician time re-dispensing medications, and productivity costs.

Assessing the Efficacy and Safety of Sodium Zirconium Cyclosilicate for Use in Acute Severe Hyperkalemia from a Standardized Order Set

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Learning Objectives:

1. Review current literature on the use of cation exchange resins in acute hyperkalemia
2. Identify the specific patient population that may benefit from Lokelma administration in acute severe hyperkalemia

Purpose:

In 2018, Lokelma (SCZ) was FDA approved for hyperkalemia with a caveat that it should not be used as emergency treatment for acute hyperkalemia because of its delayed onset of action. In 2022, SCZ was added to the Corewell Health East (CHE) guideline for treatment of acute hyperkalemia alongside Kayexalate. The practice of using cation exchange resins in acute hyperkalemia is based on physician preference and is not supported by high quality data. The purpose of this study is to assess the efficacy of SCZ compared to the standard of care (SOC) in acute severe hyperkalemia and will add to the limited literature available.

Methods:

In this multi-center, retrospective review of 186 adult patients who were treated for acute hyperkalemia at CHE from September 13th, 2022, to July 1st 2023 65 patients that received the SOC were compared to 121 patients that received a dose of SCZ. The primary endpoint was the mean change in potassium from baseline up to 10-16 hours. Baseline potassium was defined as the first potassium recorded ≥ 6.5 mEq/L. Secondary endpoints included the need for additional potassium lowering measures and the incidence of hypoglycemia defined as a glucose < 70 mg/dL. Data was analyzed using SPSS software and a two-tailed T-test.

Results:

In the SOC group, the mean change in potassium was –2.0 mEq/L compared to –1.5 mEq/L in the SCZ group (95% CI, 0.24-0.88, p< 0.01). Patients in both groups received similar cumulative doses of insulin (18 vs. 19 units, 95% CI, 1.8-4.7, p=0.38). SCZ patients received more furosemide doses compared to the SOC (53 vs. 116 mg, p<0.05). The incidence of hypoglycemia was slightly higher in the SOC compared to SCZ (33% vs. 31%, p=0.763). 45% of patients in the SCZ group had baseline chronic kidney disease (CKD) vs. 30% in SOC (p <0.05). A subgroup analysis showed that in patients with CKD, there was a greater change in mean potassium in the SOC group compared to SCZ group (-2.3 mEq/L vs -1.5 mEq/L, p< 0.05).

Conclusions:

SCZ for the treatment of acute severe hyperkalemia is not associated with a greater change in serum potassium compared to the SOC. Limitations include more baseline CKD in the SCZ group compared to SOC. These results challenge the idea that cation exchange resins should be used in acute hyperkalemia.

Impact of a Pharmacist-Driven Iron Deficiency Anemia Clinic

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Learning Objectives:

1. Describe the workflow of a pharmacist-driven iron deficiency anemia clinic
2. Evaluate the impact of a pharmacist-driven iron deficiency anemia clinic improves hemoglobin in patients with iron deficiency anemia

Purpose:
Pharmacists have proven to be beneficial in improving patient outcomes and increasing compliance. The aim of this study is to assess the impact of a pharmacist-driven iron deficiency anemia clinic. The primary objective was to evaluate the impact of the clinic by comparing the change in hemoglobin at baseline to 3 months after pharmacist intervention. Secondary outcomes included adherence to guidelines, change in hemoglobin at 6 and 12 months, change in ferritin and iron saturation at 3, 6, and 12 months, and percentage of patients who got follow-up labs.

Methods:
This is a retrospective chart review of patients who received care from the pharmacist-driven iron deficiency anemia clinic. Patients are referred to this clinic are, reviewed by a pharmacist, and then referred to receive intravenous iron if eligible. Patients were eligible if hemoglobin was <12 for females and <13 for males, ferritin <30, or >30 with iron saturation <20%. Patients who received at least one iron infusion and follow-up labs were included. Patients were excluded if they were pregnant, had heart failure, received an erythropoietin stimulating agent, had restless leg syndrome, or if they got intravenous iron during hospitalization.

Results:
A total of 175 patients were included. Median participant age was 48.8 years, 85.71% were female, and 52.57% identified as Black. 94.86% of patients appropriately received guideline-directed intravenous iron. A significant increase in hemoglobin was found from baseline to 3, 6, and 12 months post-intervention, 10.1 g/dL to 11.1 g/dL, 12.2 g/dL, and 12.1 g/dL, respectively. A significant increase was also found in ferritin and iron saturation at 3, 6, and 12 months post-intervention. The percent of patients that obtained hemoglobin labs at 3, 6, and 12 months was 95.43%, 74.29%, and 54.29%. The percent of patients that obtained ferritin labs were 95.43%, 70.86%, and 53.14%, respectively and 96%, 69.71%, and 52.57% for iron saturation.

Conclusions:
Implementation of a pharmacist-driven iron deficiency anemia clinic significantly improved patients' hemoglobin, ferritin, and iron saturation levels up to 12 months post intervention. Our findings suggest that a pharmacist-driven clinic can positively impact patients with iron deficiency anemia.

Evaluation and Implementation of a Standardized DPYD Testing Protocol for Patients Receiving Fluoropyrimidine-based Chemotherapy in the Medical Oncology Setting

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Learning Objectives:

1. Review physiological significance of DPYD metabolism in patients receiving fluoropyrimidine-based chemotherapy and the role of pharmacogenomics in optimizing treatment
2. Discuss implementation of standardized PGx testing in clinical oncology practice

Purpose:

Pharmacogenomics (PGx) is being increasingly utilized in healthcare to optimize treatment outcomes. Patients receiving fluoropyrimidine chemotherapy benefit from PGx testing given the potential for severe, even fatal, side effects associated with dihydropyrimidine dehydrogenase (DPYD) deficiency. Despite these risks, PGx testing prior to initiation of fluoropyrimidine chemotherapy is not yet considered standard of care in the United States. Since 2022, St. Elizabeth Healthcare has maintained an internal procedure recommending pre-treatment DPYD testing. The goal of this multi-site, mixed-methods study was to evaluate clinician perceptions and adherence to this policy, and to identify barriers/facilitators to implementing standardized PGx testing.

Methods:

Between June and December 2023, 217 patients received 5-fluorouracil (n=114) or capecitabine (n=103) and were retrospectively reviewed to evaluate policy adherence. Cohorts were cross-referenced with the SEH Precision Medicine PGx registry to evaluate the percentage of patients with a DPYD PGx test. A semi-structured interview to assess clinician perceptions was developed using the Consolidated Framework for Implementation Research (CFIR). We invited 28 clinicians to interview as a representative sample of the multidisciplinary medical oncology team providing services across both inpatient and ambulatory settings. Respondent data guided subsequent development of phased implementation methodology.

Results:

The overall percentage of DPYD testing in the retrospective 5-fluorouracil and capecitabine cohorts was determined to be 86% and 84%, respectively. For the qualitative portion of the study, 24 of 28 invited clinicians responded, including 4 physicians, 6 clinic nurses, 7 APRNs, and 7 pharmacists. All respondents had positive perceptions of DPYD testing, but several implementation barriers were identified. The most prominent of these were difficulty tracking historical testing (75%, n=18), test turn-around time (50%, n=12), inconsistent ordering practices (50%, n=12), inadequate PGx education (37%, n=9) and test cost (33%, n=8). Only 50% (n=12) reported being satisfied with the current process.

Conclusions:

Standardized DPYD testing has broad support from clinicians, but there are opportunities to optimize testing and clinical application within medical oncology. Our study suggests that to address common barriers to implementation, PGx test results should be readily accessible, have a rapid turn-around time, be minimally intrusive for patients, and be accompanied with ample educational support for clinicians.

The Effect of Dexmedetomidine on Rescue Analgesic Needs in Non-intubated Intensive Care Patients

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Learning Objectives:

1. Review current indications for dexmedetomidine in the intensive care unit.
2. Discuss the significance of adjunct analgesic use and the effect on use of opioid rescue analgesics.

Purpose:

Pain is one of the most common and debilitating complications of a stay in an intensive care unit (ICU). While guidelines acknowledge opioids as a mainstay to manage ICU pain, they also recommend the use of multimodal opioid-sparing regimens. Studies have shown that adjunct analgesics can decrease opioid requirements in ICU patients, however they usually only include intubated patients. There are additional studies that have shown that dexmedetomidine can be effective adjunct analgesic, but they are limited in number. To better evaluate the role of dexmedetomidine use in the adult ICU, more information needs to be gathered on its analgesic effect and its utility in non-intubated patients.

Methods:

This study is a retrospective cohort analysis between adult non-intubated ICU patients on dexmedetomidine, and non-intubated ICU patients not on dexmedetomidine who were admitted to The University of Toledo Medical Center between October 1, 2022 and August 31, 2023. To be included, patients must have an as-needed opioid order with corresponding pain score and at least one other pain assessment, and cannot have symptomatic bradycardia. The primary study objective is to assess the amount of morphine milligram equivalents (MME) received during ICU admission with or without concomitant dexmedetomidine infusion. Secondary outcomes include the time to first dose of rescue opioid analgesia and ICU length of stay.

Results:

A total of 44 patients were included. There was no statistical difference in demographics between groups except for ICU admission indication ($p=0.001$). There was a significant statistical difference in the total amount of MME received, with the dexmedetomidine group having significantly less (average of 19.6 MME) than the control (average of 82.2 MME) ($p<0.001$). Secondary outcomes and additional analyses will be presented at the Ohio Pharmacy Residency Conference.

Conclusions:

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

Retrospective evaluation of heparin syringe protocol for anticoagulation in patients receiving continuous renal replacement therapy

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Learning Objectives:

1. Discuss the utility of heparin syringe anticoagulation with regards to preventing clotting of continuous renal replacement therapy filters.
2. Review data from this institution's protocol for heparin syringe anticoagulation in patients receiving continuous renal replacement therapy.

Purpose:

Continuous renal replacement therapy (CRRT) involves contact between the patient's blood and the extracorporeal circuit leading to activation of the coagulation cascade. Often, anticoagulation is utilized to prevent clotting of the CRRT filter, with the goal of limiting interruptions in CRRT by extending filter life. The purpose of this study is to evaluate the incidence of and time to filter clot among CRRT filters in patients who are and are not therapeutic on St. Elizabeth's heparin syringe protocol. Furthermore, this study will assess registered nurse (RN) compliance to the established protocol and identify areas for improvement.

Methods:

This retrospective study includes a chart review of patients admitted to intensive care units across the St. Elizabeth Healthcare system who are receiving CRRT from January 1st, 2021 through November 30th, 2023. Patients 18 years of age and older who received CRRT were included in the study. Exclusion criteria included patients anticoagulated with both the heparin syringe protocol and a heparin infusion, patients who received a direct oral anticoagulant (DOAC) within the past 72 hours or patients on therapeutic anticoagulation at the time of CRRT initiation, and patients who received regional citrate anticoagulation. A retrospective chart review was performed to collect the following data: demographics (age, sex, weight), location and unit, time and dose of first heparin syringe, time of anti-Xa collection, anti-Xa values, dose of heparin at time of first therapeutic anti-Xa, if the RN adjusted the dose following the anti-Xa result, if the RN adjustment was correct, time of dose adjustment, if the CRRT filter clotted, time of filter clot, anti-Xa at time of clot, and CRRT filter type.

Results:

Results will be presented at the Ohio Pharmacy Resident Conference.

Conclusions:

Conclusions will be presented at the Ohio Pharmacy Resident Conference.

Establishment of a Warfarin Pharmacy to Dose Guideline in a Community Hospital

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Learning Objectives:

1. Introduce the process of establishing a pharmacy-driven warfarin dosing system
2. Implement specific dosing guidance for pharmacists to follow
3. Establish consult agreement for pharmacist to dose warfarin at University Hospitals Ahuja Medical Center

Purpose:

Warfarin is an oral anticoagulant recommended for indications such as prevention of embolism in patients with atrial fibrillation, prosthetic heart valves, and other hypercoagulable conditions. As a high alert drug with a narrow therapeutic index, interpatient variability, and frequent monitoring, warfarin can be a challenge to dose appropriately. Routine monitoring of the International Normalized Ratio (INR) helps maintain patients in goal range and decrease risks for adverse events. The purpose of this service would be to establish a comprehensive process for monitoring safety and efficacy of warfarin therapy by pharmacists at University Hospitals Ahuja Medical Center (UH AMC).

Methods:

A guideline for pharmacist-to-dose warfarin will be created for initiation and maintenance of warfarin therapy. The guideline will cover pharmacist responsibilities when a provider prescribes warfarin therapy and will also provide a nomogram for starting and continuing patients on therapy during inpatient admission. Responsibilities will include reviewing the chart for pertinent information (indication for anticoagulants, past medical history, INR, etc.), ordering INRs, and contacting the provider if adjustments need to be made outside of the nomogram. The guideline will have guidance on patient disease state, drug interaction, and nutrition state. This guideline will be presented at the Ahuja Medical Center Medication Safety and Therapeutics Committee to inform caregivers in the hospital on the steps that are being taken for implementation. After being reviewed by the Medication Safety and Therapeutics Committee, the guideline will then undergo final approval by the Chief Medical Officer, along with an official consult agreement. Following this, pharmacists will undergo training covering all aspects of the warfarin dosing procedure. Additionally, education will cover counseling points for patients newly initiated on warfarin therapy. Pharmacist proficiency in warfarin dosing will be assessed through competency evaluations. The participation of pharmacists in warfarin management will contribute to the growth of pharmacy services and elevate the standard of patient care at Ahuja Medical Center.

Implementation of a Pharmacist-Driven CGM Management Service in House Calls Patients with Type 2 Diabetes

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Learning Objectives:

1. Describe a novel quality improvement initiative to optimize CGM utilization in home bound older adults through pharmacist education and intervention
2. Discuss barriers and opportunities for optimized CGM utilization in older adult patients

Purpose:
Continuous glucose monitors (CGMs) have revolutionized diabetes management by improving outcome measures and empowering patients to make appropriate choices regarding their diabetes care. CGM systems were not being used to their full capability in older patients seen by the Summa House Calls service. Previous publications have demonstrated the utility of pharmacist intervention in CGM management. We set out to implement a pharmacist-driven service within the Summa House Calls Team to optimize CGM use to improve outcomes in these patients.

Methods:
We established a CGM management service from October 2023 through January 2024. Included patients were ≥60 years old with type 2 diabetes managed by the Summa House Calls team. Pharmacists provided in-home CGM education, medication review and introduction to data-sharing platforms. Data was obtained from CGM Ambulatory Glucose Profiles displaying two weeks of glucose readings. The primary outcome looked at Time in Range (TIR), the percentage of recorded time that readings were 70-180 mg/dL. We evaluated whether patients achieved a TIR of ≥70% before and four weeks after pharmacist intervention. The primary outcome was evaluated using McNemar's test of concordance.

Results:
At the time of analysis, 11 patients had been evaluated by the service. The cohort had a median age of 79. Most patients were female (64%) and white (82%). Most patients had Freestyle Libre 2 systems (64%) and over half of patients had a HbA1c above goal at baseline (55%). At baseline, four of the eight patients with existing CGM systems had TIR ≥70%. Four weeks after initial intervention, five patients (45%) achieved TIR ≥70% (p=1.0) while six patients (55%) had not. At the time of analysis, all patients were registered with data sharing platforms and six patients (55%) were independently sharing data with providers. Nine non-pharmacological and six pharmacological recommendations were made. Unique barriers to achieving glucose control were also identified and synthesized.

Conclusions:
A pharmacy service aimed at improving CGM utilization in the Summa House Calls population was implemented and will be continued. The project highlighted barriers older patients with diabetes face in achieving glucose control. The timeframe limited the achievement of statically significant outcomes.

Impact of pharmacogenomic alerts on prescribing actions in a healthcare setting

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Learning Objectives:

1. Review the importance of pharmacogenomics and how it can be implemented into a healthcare system.
2. Discuss the clinical impact of pharmacogenomic best practice alerts in our healthcare system.

Purpose:

Advances in pharmacogenomics (PGx) allow providers to predict efficacy and toxicity profiles of medications based on their patients' genetic profile. At St. Elizabeth Healthcare (SEH), pharmacogenomic test results are entered into the electronic health record (EHR) and a third-party system is used to generate interruptive best practice alerts (BPAs) which alert clinicians of actionable genomic information for a given medication order. The purpose of this study is to determine how often interruptive pharmacogenomics alerts led to a change in therapy consistent with the BPA.

Methods:

This retrospective study investigates the acceptance of BPAs by ordering providers from the start of genetic testing in February of 2019 through August of 2022. The study population included patients from all SEH sites in both inpatient and outpatient settings. Eligible patients were adults 18 years and older with pharmacogenomic testing and at least 12 months of continuous care at SEH after a test resulted with “highly actionable” results. Exclusion criteria were patients with no encounters after test results, transferred care or were deceased within 12 months following test results, or erroneous alerts. Data was collected from vendor reports, EHR reports, and manual chart review. This included demographics, reason for pharmacogenomic testing, medication and therapeutic class, relevant gene, BPA, date and time of BPA, along with the names of the test ordering provider and the provider who received the BPA. The primary outcome is to determine how often interruptive pharmacogenomics alerts led to a change in therapy that was consistent with the BPA. The secondary outcomes include the number of providers who received a BPA, number of unique medication orders, and impact of provider credentialing and specialties on BPA acceptance rate.

Results:

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

Conclusions:

Conclusions will be presented at the Ohio Pharmacy Resident Conference.

Efficacy and Safety of Vitamin K for INR Reduction in Liver Disease

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Learning Objectives:

1. Describe hemostatic imbalances in patients with liver disease and current gaps in treatment guidelines
2. Discuss the potential adverse event considerations and utility of vitamin K in patients with liver disease and an elevated INR

Purpose:
Individuals with liver disease are predisposed to an imbalance of blood clotting factors, increasing the risk of bleeding or clots. The International Normalized Ratio (INR), which demonstrates relative blood clotting speed, may be elevated. Phytonadione (vitamin K) works to activate coagulation factors and is sometimes given to reduce bleed risk. The purpose of this study was to evaluate changes in elevated INRs following vitamin K administration in hospitalized patients with liver disease (not on anticoagulation) and to assess rates of bleeding and clot events.

Methods:
This cohort study was conducted by retrospective chart review. The primary aim was to assess the INR lowering effect of one dose of vitamin K in patients with liver disease with an elevated INR (≥ 1.8) by comparing INRs before and after administration. Secondary aims assessed adverse bleeding or clotting events during admission.

Results:
A total of 180 patients with liver impairment and an elevated INR were analyzed; 90 received one dose of vitamin K, and 90 patients presented similarly but did not receive vitamin K (control group). INR was lowered on average by 0.23 points (95% CI, -0.96 to 0.51). Rates of adverse bleeding were 22.22% in the treatment group and 10% in the control group ($p < 0.001$). Rates of thromboembolic events were 2.22% in the treatment group and 0.56% in the control group ($p=0.174$).

Conclusion:
Vitamin K did not always lower the INR by an appreciable amount, and in some cases the INR continued to increase following administration. Those in the vitamin K group were more likely to have a bleed (either before or after administration), indicating its use may be more common in higher acuity patients. This analysis suggested there is no current way of predicting INR response to one dose of vitamin K in patients with liver impairment.

Comparison of 0.45% Sodium Chloride and 0.9% Sodium Chloride Maintenance Fluids in Pediatric Patients

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UAN: 0048-0000-24-019-L01-P

Learning Objectives:

1. Describe the historical recommendations regarding use of maintenance fluids in pediatric patients
2. Recognize the differences in composition of hypotonic and isotonic fluids
3. Review literature and guideline recommendations regarding use of maintenance fluids in pediatric patients

Purpose:

The 2018 American Academy of Pediatrics (AAP) guidelines advocate for the use of isotonic maintenance fluids over hypotonic maintenance fluids to prevent hyponatremia. However, the guidelines do not specify preferences among isotonic solutions, nor do they distinguish between balanced and unbalanced alternatives. Hypotonic fluids pose a risk of hyponatremia, whereas unbalanced isotonic fluids may carry a risk of hypernatremia, hyperchloremic metabolic acidosis and acute kidney injury. This study aims to compare the incidence of hyponatremia, hypernatremia, hyperchloremia, and assess the acid-base status in pediatric patients receiving 0.45% sodium chloride (NaCl) vs 0.9% NaCl containing maintenance fluids (MF).

Methods:

This is a single-center historical cohort study of hospitalized children admitted to Ascension St. John Children's Hospital between January 1, 2020 and September 30, 2023. Patients between ages 28 days to 18 years, admitted to the Pediatric Intensive Care Unit (PICU) or pediatric floor, who received MF containing 0.45% NaCl or 0.9% NaCl, and had a baseline electrolyte panel were included. Patients were excluded if they met any of the following criteria: neurosurgical disorders/procedures during admission, congenital/acquired heart disease, hepatic disease, cancer, renal dysfunction, diabetes insipidus, diabetic ketoacidosis, severe burns, voluminous watery diarrhea, required invasive mechanical ventilation or the use of vasopressors during admission, did not have at least one repeat electrolyte panel at a minimum of 24 hours after fluid initiation (±6 hours), had a baseline plasma sodium 150 mmol/L, had a switch or interruption in their MF before 24 hours, or those who did not receive fluids at a rate of 100-150% maintenance defined by the Holliday and Segar method for a minimum of 24 hours. The primary outcome of the study is to determine the incidence of hyponatremia in patients receiving 0.45% NaCl vs 0.9% NaCl MF at 24 hours. Secondary outcomes include the changes in serum sodium at 24 hours, incidence of hypernatremia, hyperchloremia, and acid-base status.

Results:

To be presented at the Ohio Pharmacy Residency Conference.

Conclusions:

To be presented at the Ohio Pharmacy Residency Conference.

Cracking the Code: Reviving Subcutaneous Opioid Injections and Changing the Standard of Care to Optimize Patient Outcomes

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Learning Objectives:

1. Discuss historical use of subcutaneous opioids
2. Review opioid pharmacokinetics
3. Explain the benefits of oral and subcutaneous opioids compared to intravenous opioids

Purpose:
Intravenous (IV) opioids are commonly utilized within the hospital setting despite an increased risk of adverse effects compared to oral (PO) opioids. This quality improvement initiative sought to change the standard of practice (SOP) for opioid administration to favor oral (PO) opioids in patients able to tolerate PO intake and SUB-Q opioids for patients unable to tolerate PO and/or requiring more rapid pain relief. IV opioids remained available if deemed appropriate by the attending provider but was not a preferred route of administration. The primary objective was number of IV opioid administrations per patient day (PPD). Secondary outcomes included number of all opioid administrations via all routes, oral morphine equivalents (OMEs), and daily pain scores, each measured PPD, during the first five days of admission to the select unit.

Methods:
This pilot study was conducted on a 20-bed adult general medicine unit at OhioHealth Riverside Methodist Hospital in Columbus, Ohio. Patient-reported pain scores and details of opioid administrations including medication, dose, and route were collected prior to and following education and implementation of the new SOP. Pre-intervention data was collected for six months (Mar 1, 2023 – Aug 31, 2023). The month of September was utilized to educate providers, pharmacists, and nurses on project objectives, opioid safety and efficacy, and appropriate use of the SUB-Q route. The new SOP was implemented on October 2, 2023, and post-intervention data was collected for three months (Oct 2, 2023 – Dec 31, 2023).

Results:
Post-intervention data demonstrated a statistically significant decrease in number of IV opioid administrations (2.4 [1.7] vs. 1.6 [0.8], p=0.003), total OMEs (28.9 [33.3] vs. 25.6 [24.9], p=0.273), and pain scores PPD. Statistically significant reductions in patient-reported pain scores were seen on days one (5.0 [2.9] vs. 4.5 [3.0], p=0.039) and five (4.3 [2.5] vs. 3.3 [2.2], p=0.004).

Conclusions:
Opioid education and implementation of a new SOP reduced exposure to IV opioids and provided better pain control, as evidenced by lower pain scores, with fewer OMEs.

Fixed-dose versus Weight-based 4-Factor Prothrombin Complex Concentrate for Direct Oral Anticoagulant Reversal: Impact on Clinical Outcomes in Intracranial Hemorrhage.

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UAN: 0048-0000-24-021-L01-P

Learning Objectives:

1. Classify the appropriate use of fixed-dose vs weight-based 4-Factor Prothrombin Complex Concentrate
2. Describe the impact of fixed-dose 4-Factor Prothrombin Complex Concentrate on patient care
3. Identify appropriate patients eligible to receive 4-Factor Prothrombin Complex Concentrate

Purpose:
An Intracranial Hemorrhage (ICH) can be fatal if not reversed appropriately and within a reasonable time frame. Therefore, optimizing the dosing strategy is of vital importance. Currently, there is minimal literature comparing the benefits and outcomes of fixed-dose vs weight-based dosing in this patient population. The purpose of this study is to determine if fixed-dose 4-Factor Prothrombin Complex Concentrate (4F-PCC) achieves similar hemostatic and clinical outcomes compared to weight-based dosing in patients with Direct Oral Anticoagulant (DOAC)-associated ICH.

Methods:
A retrospective chart review was performed for patients with a DOAC-related ICH that were treated with 4F-PCC in an eight-hospital network from 1/1/2019 through 4/30/2023. Each patients chart was reviewed for the following information including, but not limited to hematoma size before and after 4F-PCC administration, discharge disposition, and length of stay. The primary objective was achievement of effective hemostasis which is defined as hematoma stability or an improvement in hematoma volume on first neuroimaging result within 24 hours of 4F-PCC administration. The secondary objectives of this study include thromboembolic events, in-hospital mortality, repeat 4F-PCC dosing, transfusion of other blood products, discharge disposition, and cost savings.

Results:
205 patient charts were reviewed for this study. 145 patients met the inclusion criteria and of those patients, 103 received fixed-dose 4F-PCC and 42 received weight-based 4F-PCC. There was no difference in the primary outcome between the two dosing regimens. 83 patients (79.6%) in the fixed-dose group and 28 patients (66.7%) in the weight-based group achieved effective hemostasis (p=0.098).

Conclusion:
There was no statistically significant differences in clinical outcomes between the two regimens. A fixed-dosing regimen offers potential cost savings benefits and decreased confusion for ordering physicians, pharmacists, and nurses. Further investigations in larger populations would help determine the appropriateness of fixed-dose 4F-PCC in patients with a DOAC-related ICH.

Rounding medication restocks for automated dispensing cabinets to easily counted units of measure and its impact on overstock and time requirements of pharmacy technicians and pharmacists

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UAN: 0048-0000-24-022-L04-P

Learning Objectives:

1. Identify the eight types of waste commonly identified in lean processes using the acronym DOWNTIME
2. Discuss the types of waste that may be impacted by rounding medication restocks to easily counted units of measure

Purpose:

Waste is common within the United States healthcare system and is a concern in hospital institutions and acute care pharmacies. Some common wastes in the acute care pharmacy are overproduction and excess inventory due to poorly used automation which may result in expiration of unused medications. Other wastes include wasted time and not utilizing appropriate skills in a cost-effective manner. This study reviews the effects of automated rounding of medication restock amounts and its impact on overstocking medications and the time it takes pharmacy technicians and pharmacists to complete required steps in the restock process.

Methods:

This is a pre-post intervention study reviewing restocking processes with a pre-intervention phase of September 1, 2023 to February 29, 2023 and a post-intervention phase of April 1, 2024 to April 21, 2024. Automated rounding down of medication restocking amounts occurred utilizing unit-dose multiples of one, five, or ten based on the individualized maximum par value assigned to the medication at the automated dispensing cabinet. All routine restocks to non-anesthesia, non-operating room area automated dispensing cabinets located at Holzer Hospital Foundation were evaluated for the number of times a medication was stocked over the maximum par level for the medication. Each restock was also evaluated for time it took pharmacy technicians to pull medications for the restock, time it took a pharmacist to verify the restock was accurate, and time it took pharmacy technicians to physically restock automated dispensing cabinets. A total of 364 pre-intervention routine restocks will be examined and compared to 42 post-intervention routine restocks. All continuous variables being studied will be analyzed using either student's t-test or Mann-Whitney U test.

Results:

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

Conclusions:

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

Improving Care through Community-Based Specialty Pharmacist Intervention

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UAN: 0048-0000-24-023-L04-P

Learning Objectives:

1. Explain the benefits of community-based specialty pharmacist intervention on patient outcomes.
2. Identify common therapy-related issues that can be addressed by community-based specialty pharmacists.
3. Suggest changes to future community-based specialty pharmacy practice based on the results of this study.

Purpose:
The objective of this retrospective observational cohort study is to analyze and assess the relationship between community-based specialty (CBS) pharmacist interventions and patient outcomes. Pharmacist intervention has been shown to lead to improvements in therapy-related issues (TRIs) through sustained therapeutic efficacy, maintained quality of life, and improved adherence. CBS pharmacists screen patients for these TRIs in their daily practice in order to carry out appropriate interventions, the details of which are recorded using a care plan form. Open care plans are reviewed at appropriate intervals in order to ensure adequate progress, and then closed when the issue is resolved.

Methods:
The study site is a CBS pharmacy located in a large metropolitan area. This study reviewed care plans closed between 1/1/21 and 12/31/22 for TRIs related to adherence, adverse effects, or efficacy. The primary endpoint was the final recorded outcome of each care plan. Secondary endpoints included duration of open care plan in days, type and number of pharmacist interventions required, improvement in proportion of days covered (PDC) for adherence TRIs and resolution of adverse effects and efficacy TRIs, based on the course of the patient's therapy. Descriptive statistics were used for the primary endpoint. Correlation was assessed between the duration of the care plan and its final outcome using the point-biserial correlation, and between the type of TRI and the care plan's final outcome using the chi-square test of independence. There were 70 care plans available; a sample size of n=67 care plans would be sufficient to detect a correlation of r=0.3 with 70% power and a two-sided alpha of 0.05.

Results:
Of available care plans, 63 met inclusion criteria, involving 60 patients (60% female) with a mean age of 65.7 (SD 15.2). A positive primary endpoint was recorded in 84.1% of care plans. On average, they were open for 99.5 days (SD 132.1) and required 3.1 pharmacist touchpoints (SD 1.6). Nearly half (49.2%) involved patient counseling only. Data indicated a moderate association between fewer pharmacist touchpoints and positive recorded outcomes (r=-0.22, p=0.08). Adverse effect- and efficacy-related issues were resolved at a rate of 74.1% and 70%, respectively. For adherence-related care plans, while overall PDC did not significantly improve (p=0.13), 59.1% led to improved PDC.

Conclusions:
Data confirm that a large majority of care plans are closed with positive resolutions. Low PDC improvement for adherence care plans highlights a growth opportunity for the study site. Limitations included sample size, completeness of data, and subjectivity of the primary endpoint determination.

Development of a Pharmacy-Led Anti-Factor Xa Monitoring Protocol for High-Risk Populations on Enoxaparin

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Learning Objectives:

1. Describe pharmacokinetic and pharmacodynamics of enoxaparin in high-risk patients.
2. Review current literature and consensus regarding anti-Factor Xa monitoring.

Purpose:
Despite the availability of an anti-Factor Xa assay calibrated for low molecular weight heparin (LMWH) monitoring, its clinical implementation is not well-established. Current guidelines have a weak recommendation for the use of anti-Factor Xa monitoring in high-risk patients (extremes of weight and/or renal insufficiency) to improve safety and efficacy due to unpredictable pharmacokinetics. There are few recommendations and scarce literature for dose adjustments based on anti-Factor Xa levels and mixed evidence for its practical application. The purpose of this study is to develop a pharmacy-led protocol that identifies high-risk patients most likely to benefit from anti-Factor Xa monitoring and dose adjustments.

Methods:
A retrospective review of enoxaparin use during January 2023 was performed to determine patient benefit groups. A total of 749 enoxaparin orders were reviewed, and 236 were determined to qualify for anti-Factor Xa monitoring based on current literature recommendations of extremes of weight (BMI ≥30 kg/m² or BMI ≤18.5 kg/m²) or renal insufficiency (CrCl <30 mL/min). Additional bleed and thrombosis risk factors were examined to further determine patients most likely to benefit. The proposed protocol was approved by the Pharmacy and Therapeutics Committee and the protocol was implemented in the intensive care unit. The prospective portion of the project was performed during April 2024 and included patients with a.) an extreme of weight and renal insufficiency, b.) an extreme of weight plus additional bleed or thrombosis risk factors, c.) renal insufficiency plus additional bleed or thrombosis risk factors, or d.) hemodialysis. Pharmacist anti-Factor Xa interventions and anti-Factor Xa levels before and after adjustment were examined.

Results:
Final results will be presented at the 2024 Ohio Pharmacy Resident Conference.

Conclusions:
To be presented at the 2024 Ohio Pharmacy Resident Conference.

Electronic Medical Record Order Set Optimization in a Rural Health-System Infusion Center

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UAN: 0048-0000-24-025-L04-P

Learning Objectives:

1. Describe the workflow for pharmacists in an outpatient infusion center that utilizes paper charting
2. Assess the impact of implementing electronic order sets for common chemotherapy/immunotherapy regimens

Purpose:

As the Lima Memorial Cancer Institute continues to expand, the number of orders entered and double-checked by pharmacists continues to grow. The growing number of orders increases order-entry workload on pharmacists involved. One method of lessening the workload is to build chemotherapy order sets in the electronic medical record (EMR), allowing for a reduction in the number of double-checks required. The aim of this study is to create eighteen order sets, and to evaluate their impact on pharmacist hours providing chemotherapy double-checks and overall pharmacist satisfaction.

Methods:

This study is a single-center, comparative, descriptive, interventional study. Pharmacist time double-checking orders and the number of order-entry interventions made during the double-check process were tracked to then analyze the differences in interventions from before and after order set implementation. Prior to this study, a new method of tracking pharmacist interventions during double-checks for chemotherapies was implemented in August 2023 by the Lima Memorial Pharmacy Department. As part of this research study we retrospectively reviewed interventions reported from August 2023 until implementation of the new order sets to look at the impact of the time saved as well as interventions documented. These interventions fell into one of four categories documented into the EMR: CHEMO-OE1, CHEMO-OE2, CHEMO-OE3, and CHEMO-OE4. The pharmacists involved in double-checking chemotherapies tracked hours spent completing double checks, both before and after the implementation of the project intervention. An anonymous survey involving pharmacist satisfaction level was created and sent to the pharmacists involved in the double-checking process. This survey was sent to the pharmacists prior to order set implementation and after order set implementation to evaluate the impact of the sets, and results will be analyzed. The responses to the surveys are anonymous and are not linked between pre- and post-order set addition.

Results:

Data analysis is in progress. Results and conclusions will be presented at the 2024 Ohio Pharmacy Residency Conference.

Conclusions:

Data analysis is in progress. Results and conclusions will be presented at the 2024 Ohio Pharmacy Residency Conference.

Comparing the Lillo-Le-Louet (3L) score to the 4T score in predicting heparin-induced thrombocytopenia (HIT) in cardiothoracic surgery patients receiving cardiopulmonary bypass (CPB)

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Learning Objectives:

1. Define the difference between the scoring criteria for the Lillo-Le-Louet (3L) Score and 4T Score.
2. Discuss the difference in sensitivity and specificity between the 3L Score and 4T Score.

Purpose:

Thrombocytopenia is common in patients who undergo CPB during cardiac surgery; additionally, these patients are at risk for HIT. Early recognition and diagnosis are crucial to prevent complications associated with HIT. An accurate pre-test scoring system is helpful to reduce unnecessary testing for HIT. The 3L score was developed to identify simple criteria to estimate the probability of HIT after CPB. The primary objective of this study was to compare the specificity and sensitivity of the 3L and 4T scores for predicting HIT in post-operative cardiothoracic surgery patients.

Methods:

This retrospective study was approved by the institutional review board. This study will include any cardiothoracic surgery patient who had a HIT panel ordered between January 1, 2018 and December 31, 2023. Exclusion criteria will include patients who did not receive cardiopulmonary bypass or heparin. The data will be analyzed using a receiver operating characteristic (ROC) curve to compare the specificity and sensitivity of the 3L and 4T scores. Descriptive baseline characteristics will be compared with Chi-square and Fisher's exact tests for categorical data and T-test and Mann-Whitney U tests for continuous data as appropriate. Finally, the cost savings from avoidance of HIT tests in patients with low pre-test score will be calculated.

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.

Exploring the Impact of Penicillin Allergy Skin Testing on Length-of-Stay in GBS Positive Mothers: A Retrospective Cohort Study

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Learning Objectives:

1. Review the impact of Group B Streptococcus infections on neonatal outcomes.
2. Explain the effectiveness of penicillin allergy skin testing on maternal and neonatal outcomes.

Purpose:
Group B Streptococcus (GBS) is a commensal bacteria found in the reproductive tract of many women. This bacteria can be transmitted to newborns during childbirth, potentially causing life-threatening infections such as meningitis and bacteremia.[2] Penicillin is the recommended antibiotic to prevent GBS transmission to newborns. However, some patients report allergies to penicillin, which can lead to the use of alternative antibiotics and more extensive monitoring.[1] There is limited data assessing maternal length-of-stay when being treated with penicillin vs alternative agents. This study aims to investigate if penicillin allergy testing in GBS positive mothers can lead to a reduced length-of-stay compared to mothers who were not tested.

Methods:
In this retrospective cohort study, researchers compared the differences in length-of-stay between GBS positive mothers who received penicillin allergy testing vs mothers who did not receive penicillin allergy testing. Patients were included from the study if they had delivered within the study period, had a GBS positive or unknown GBS status, delivered at a designated study facility, had a beta-lactam allergy documented in the medical record, and were eligible for allergy testing per local penicillin allergy testing protocol. Patients were excluded from the study if they were under the age of 18 after the start of the study period. The intervention group included 24 mothers who received penicillin allergy testing and the comparator group included 31 mothers who did not receive penicillin allergy testing.

Results:
The primary outcome comparing total length-of-stay for penicillin allergy tested and non-tested mothers was found to be the same across the two groups ($p=0.715$). Total number of ampicillin doses in mothers was found to be significantly greater in the tested group vs the non-tested group ($P<0.001$). Additionally, the total number of clindamycin doses in mothers was found to be significantly less in the tested group vs the non-tested group ($p=0.043$). As found in former studies, the total charge for medical care for neonates was significantly lower in the tested group vs the non-tested group ($p=0.045$). A significantly greater amount of alternative antibiotics were utilized in the non-tested vs the tested group ($p=0.022$). All other secondary outcomes were found to be the same between the two groups.

Conclusions:
This study found that penicillin allergy skin testing did not reduce maternal postpartum length of stay, however alternative benefits of penicillin allergy skin testing were discovered. More studies assessing benefits of penicillin allergy skin testing on inpatient length-of-stay, cost, and antibiotic use should be performed to confirm these findings.

Finding AP Gap: An Assessment of Antibiotic Use in Acute Pancreatitis

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Learning Objectives:

1. Discuss indications for the use of antibiotics in acute pancreatitis
2. Evaluate the risk of adverse events in patients that received antibiotics for acute pancreatitis

Purpose:

The use of antimicrobial prophylaxis in acute pancreatitis is controversial. There are many conflicting studies that analyze the clinical and mortality benefits (or lack thereof) of antibiotic use in acute pancreatitis. Despite the current American Gastroenterology Association (AGA) guideline recommendations regarding antibiotic use in pancreatitis, antibiotics are often utilized in patients that do not meet criteria for antibiotic initiation. Based on literature available, more than half of patients with severe acute pancreatitis receive antimicrobial prophylaxis even though not all patients with severe acute pancreatitis qualify for antimicrobial therapy per AGA guidelines. Additionally, there is minimal literature assessing the adverse effects associated with antibiotic use in severe acute pancreatitis. Our goal for this study was to identify gaps in the management of acute pancreatitis in our health system.

Methods:

We performed a retrospective cohort study on adult patients hospitalized in our healthcare system from January 1, 2021 to December 31, 2022 who had a diagnosis of acute pancreatitis and received at least one dose of an antimicrobial agent during their hospital admission. Patients were excluded if the patient had multiple indications for antimicrobial therapy or antimicrobial therapy was not continued by the primary team. In patients with multiple hospitalizations, only the first hospitalization was included. The primary objective for this study was to evaluate the appropriateness of antibiotic use in patients with acute pancreatitis. Secondary objectives included describing patient outcomes during and after admission and management strategies.

Results:

Results will be presented at the 2024 Ohio Pharmacy Residency Conference.

Conclusions:

Discussion of results will be presented at the 2024 Ohio Pharmacy Residency Conference.

Pharmacist-led management of glucagon-like peptide 1 receptor agonists

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Learning Objectives:

1. Review the advantages of glucagon-like peptide 1 receptor agonists for type 2 diabetes mellitus
2. Discuss the impact of pharmacist-led glucagon-like peptide 1 receptor agonists management on type 2 diabetes mellitus control

Purpose:
To date, the impact of pharmacist management of glucagon-like peptide 1 receptor agonists (GLP-1 RA) for type 2 diabetes mellitus (T2DM) has not been assessed. The aim of this study is to evaluate the impact of pharmacist-managed GLP-1 RA for patients with T2DM compared to usual care.

Methods:
This single center, retrospective study included adult patients with T2DM seen in an outpatient clinic with an initial prescription for semaglutide or dulaglutide from March 1, 2021 to March 31, 2023. Patients were evaluated as pharmacist-managed or usual care, defined as care provided by a physician. Data was collected from the time of GLP-1 RA initiation to 6 months or treatment discontinuation, defined as the end of the study period. The primary outcome was percent change in A1c from baseline to the end of the study period. Secondary outcomes were time to first GLP-1 RA titration and change in weight from baseline to the end of the study period.

Results:
44 patients were included, 18 pharmacist-managed and 26 usual care patients. Baseline A1c and weight were similar between groups. The percent change in A1c from baseline to the end of the study period was greater in the pharmacist-managed group compared to usual care (mean [SD], -27.1% [SD $\pm$ 13.5%] vs -11.4% [SD $\pm$ 13.1%]; $P < 0.01$). The pharmacist-managed group, compared to usual care, had a greater number of GLP-1 RA titrations by the end of the study period (mean [SD], 1.78 [1.0] vs 1.0 [0.8]; $P < 0.01$). The median time to first GLP-1 RA titration, and mean percent change in weight from baseline to the end of the study period were similar between groups.

Conclusion:
Pharmacist management of GLP-1 RA led to a greater change in A1c from baseline to the end of the study period compared to usual care.

The Impact of Hold Duration of Oral Vascular Endothelial Growth Factor Tyrosine Kinase Inhibitors (VEGF TKIs) on Surgical Outcomes and Complications in Cancer Patients

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UAN: 0048-0000-24-030-L01-P

Learning Objectives:

1. Describe pathophysiology of VEGF TKIs
2. Review rationale for hold recommendations
3. Discuss the impact of following hold recommendations on incidence of significant bleeding events

Purpose:
Prescribing information for oral vascular endothelial growth factor tyrosine kinase inhibitors (VEGF TKIs) include recommendations to hold treatment before surgery due to concerns for intra- and post-operative complications. This study aimed to evaluate the impact of hold duration of oral VEGF TKIs on surgical outcomes and complications in cancer patients.

Methods:
This study was a multi-center, retrospective chart review of adult patients receiving an oral VEGF TKI who underwent a surgical procedure. It compared prescribing information compliant (PIC) vs those who were prescribing information noncompliant (PINC) in regard to hold recommendations.

Results:
Sixty-four procedures on 34 patients (25 PIC vs 39 PINC). No differences in primary outcome of significant intra-operative bleeding (4% vs 17.9%, p = 0.100) or secondary outcomes of intra-operative blood loss, mean blood volume transfused, or 30-day readmission were detected.

Conclusions:
Hold duration of VEGF TKIs likely do not impact the rates of significant bleeding, intra-operative blood loss, or transfusion volume. Larger prospective studies are warranted to further refine our understanding of the optimal pre-operative management of VEGF TKIs.

Pharmacist involvement and documentation of prescriber guidance on the fluconazole and statin interaction

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Learning Objectives:

1. Recognize risk factors of statin-associated adverse drug events.
2. Describe pharmacist interventions in the management and avoidance of statin-associated adverse drug events.

Purpose:

The purpose of this study is to evaluate the current process used to manage the statin and fluconazole interaction within OhioHealth. Co-administration of fluconazole and statins with pharmacokinetically significant interactions (atorvastatin and simvastatin) increases the risk of statin-associated adverse side effects such as myopathy, rhabdomyolysis, and hepatotoxicity. The study aimed to support giving pharmacist autonomy over the management of the popular fluconazole and statin interaction and to provide additional guidance on the appropriateness of holding statin therapy when managing statin-associated drug-drug interactions.

Methods:

This was a multi-center study of adult patients admitted to certain OhioHealth hospitals between 08/30/2023 – 09/30/2023 and prescribed atorvastatin or simvastatin and fluconazole therapy within the same encounter. Patients who received a one-time dose of fluconazole were excluded. The primary outcome was to measure the frequency of physician acceptance of pharmacist recommended statin therapy alteration. Secondary outcomes were to determine frequency of and particular reasons for physician nonacceptance of pharmacist intervention and to evaluate compliance with policy Rx. 910.003 attachment D and associated pharmacist documentation via Ivents.

Results:

Data was pulled for 56 patients within the included time period. 44 patient were included (12 patients not taking interacting meds concurrently). A large majority (50%; n=22) of pharmacists overrode the fluconazole and atorvastatin or simvastatin interaction warning at verification. Of the pharmacists who intervened (n=22) there was a 95% physician acceptance rate; one physician rejected the recommendation provided without given reason. 77% (n=17) of pharmacists appropriately documented their intervention when the statin was discontinued during the duration of fluconazole therapy or the patient was transitioned to an alternative statin that does not interact.

Conclusions:

There was a high percentage of physician acceptance. No patient specific factors were collected regarding reasoning for nonacceptance. Improved compliance with policy Rx. 910.003 attachment D could lessen the number of patients kept on fluconazole and statin therapy despite the risks associated with concurrent use.

Comparison of buprenorphine microinduction to methadone in weaning opioid infusions and mechanical ventilation in critically ill patients

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Learning Objectives:

1. Describe current treatment and prevention of iatrogenic withdrawal syndrome.
2. Recognize the potential benefits of buprenorphine microinduction to wean opioid infusions.
3. Compare outcomes of patients weaned from opioid infusions using buprenorphine vs. methadone.

Purpose:

Iatrogenic withdrawal syndrome (IWS) is an opioid withdrawal that develops in critically ill patients after prolonged opioid exposure in the hospital. IWS can lead to agitation and/or ventilator dysynchrony, making it difficult to extubate patients on mechanical ventilation (MV). Historically, methadone has been used for patients on an opioid infusion at risk of, or experiencing IWS, who are failing mechanical weaning efforts. However, methadone does have serious adverse effects including QT prolongation and life-threatening respiratory depression. Buprenorphine (BUP) microinduction is a novel method of dosing BUP, involving low incremental starting doses that can be co-administered with full agonists in order to avoid precipitated withdrawal. The objective of this study is to compare the safety and efficacy of BUP microinduction to methadone in critically ill patients on MV.

Methods:

This retrospective, cohort study examined patients on MV and receiving an opioid infusion at the Detroit Medical Center. Patients were included if were on an opioid infusion for >72 hours, on MV, and started on methadone or BUP while on an opioid infusion. Patients were excluded if they were pregnant, status epilepticus, or status asthmaticus. Patients were divided into two groups based on which medication was prescribed: methadone or BUP. The primary outcome was successful weaning of the opioid infusion within 72 hours after starting the oral therapy. Secondary outcomes included successful weaning of opioid and/or sedative infusions by day 7, successful extubation, ICU-free days at day 28, and discharge disposition. The safety outcomes include QTc prolongation, and precipitated withdrawal. For the statistical analysis, descriptive statistics were used for all variables, as appropriate. For continuous variables, mean or median and inter-quartile range was used, as appropriate.

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.

Assessing the Rate of Inappropriately Crushed Medications in Skilled Nursing Facilities

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Learning Objectives:

1. Identify ISMP do not crush (DNC) medications commonly used in nursing facilities
2. Describe common reasons that medication administration errors related to crushing or opening capsules can occur in the long-term care setting
3. Assess the potential impact of consultant pharmacists on appropriate medication administration recommendations in skilled nursing facilities

Purpose:
Assess if consultant pharmacist medication management with the use of Institute for Safe Medication Practices (ISMP) do not crush (DNC) list would lead to identification of patients inappropriately receiving crushed medications.

Methods:
Participating consultant pharmacists retrospectively assessed skilled nursing residents with active medications on the ISMP DNC list for study inclusion. Study outcomes included assessing incidence of residents receiving ISMP DNC medication with “do not crush” medication orders and the incidence rate of patients receiving ISMP DNC medications who also have enteral feeding tubing, nothing by mouth orders (NPO), or inability or unwillingness to swallow medications whole.

Results:
A total of 1070 skilled nursing patients were reviewed with 778 meeting inclusion criteria. Of those 778 patients, approximately 27% were receiving inappropriately crushed medications. Of those patients, 91.5% warranted pharmacist intervention, with a total of 473 medications. Females represented 67% of the patient population and 90% of patients were 65 and over. The average number of ISMP DNC medications per patient was 3. The reasons for crushing medications varied: Only 4 patients were classified as NPO, 13 had enteral feeding tubes, 130 patients could not physically swallow medications, and 122 refused to take medications whole.

Conclusions:
Consultant pharmacists can play an integral role in ensuring patients receive medications in accordance with manufacturer guidelines and safe medication practices. There is a high rate of administration of inappropriately crushed medications in nursing homes-a rate of 27% in this study. This rate could be further confounded due to the possibility of medications being crushed despite no indication in patient chart.

Evaluating Weight-Based Enoxaparin Dosing Strategies for DVT Prophylaxis

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Learning Objectives:

1. Review available literature for use of enoxaparin in underweight and obese patients for venous thromboembolism prophylaxis.
2. Outline alternative dosing strategies for enoxaparin based on patient body mass index.

Purpose:
Enoxaparin is commonly used to prevent venous thromboembolism (VTE) events in hospitalized patients. Dosing is standardized to 40 mg daily, regardless of patient body mass index (BMI). This study aims to identify if underweight and obese patients require alternative regimens to prevent VTE or if there is an increased risk of bleeding.

Methods:
This single-center, retrospective cohort study evaluated patients admitted to the University of Toledo Medical Center from September 10, 2022 – August 1, 2023. Eligible patients were ≥18 years old, had a BMI ≤18.5 kg/m^2 or ≥35 kg/m^2, and received enoxaparin for VTE prophylaxis.
The primary study outcome was a composite of bleeding events, newly identified VTE events, and in-hospital mortality among underweight and obese patients. The dosing regimens evaluated in the underweight population were 30 mg daily versus 30 mg twice daily versus 40 mg daily. The regimens evaluated in obese patients included 40 mg daily, 30 mg twice daily, and 40 mg twice daily. The primary outcome was evaluated via Fisher's Exact Test. Secondary analyses included subgroup analyses of VTE/bleeding occurrence based on patient age and admitting unit, length of stay, and recurrence of VTE/bleeding events.

Results:
There was no significant difference in VTE/bleeding/mortality events based on dosing regimen in the underweight population (enoxaparin 30 mg daily versus 40 mg daily, p=1.00; 30 mg twice daily versus 40 mg daily, p=1.00). No events occurred within the 30 mg twice daily cohort; therefore, statistical analyses could not be performed. No significant difference was found in the primary outcome between dosing regimens in the obese population (p=0.089; p=0.05; p=0.547).

Conclusion:
No increased risk of VTE/bleeding events were found between the enoxaparin regimens in underweight or obese patients. Further research is warranted to determine if the standard dosing of enoxaparin is safe and efficacious for all patients.

Evaluation of Potential Cost Savings Associated with Filling Long-Acting Injectable Antipsychotic Prescriptions within a community health system specialty pharmacy.

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Emma Sapp, PharmD, BCACP, Emily Young, PharmD, BCPS, BCACP, and Andrea Kramer, PharmD, CDCES, CSP

UAN: 0048-0000-24-035-L04-P

Learning Objectives:

1. Describe the place in therapy, indications, and dosing regimens of Long-acting injectable antipsychotics (LAIAs).
2. Explore the cost savings associated with filling Long-acting injectable antipsychotics (LAIAs) within a community health system specialty pharmacy.

Purpose:

Long-acting injectable antipsychotics (LAIAs) are prescribed for patients experiencing persistent and serious mental illnesses (e.g., schizophrenia, schizoaffective disorder). They are often prescribed in the context of patient nonadherence to oral antipsychotics but have broader benefits for health outcomes. LAIAs have demonstrated positive outcomes for people with serious mental illnesses such as bipolar disorder, schizophrenia, and psychosis. They are underused, and access to LAIAs can be challenging. Pharmacists can play a key role in dispensing, administering, and monitoring LAIAs. The published literature surrounding pharmacist administration of LAIAs is limited, providing little-to-no guidance for the development and implementation of this service by others. Currently, behavioral health specialists in our health system are practicing out of offices not eligible for 340b drug pricing and sending LAIA prescriptions to outside pharmacies for delivery to physician office to be administered. There are hospital outpatient departments throughout the health system that would allow 340b drug pricing if these prescriptions were to be sent from that location, such as our pharmacist led medication management clinics.

The primary objective of this study is to estimate the total cost savings associated with filling LAIAs within the health system with 340b pricing compared with wholesale acquisition cost. The secondary objective of this study is to estimate the total revenue associated with filling LAIAs within a community health system specialty pharmacy without 340b pricing.

Methods:

This retrospective review will analyze all long-acting injectable antipsychotic prescriptions sent by Behavioral Health Physicians over a six-month period from June 2023 to December 2023. The data will then be extrapolated to estimate potential cost savings associated with filling 12 months of prescriptions within a community health system specialty pharmacy Specialty pharmacy both through standard reimbursement and 340B purchasing. Data collected includes patient demographics, LAIA name and dosage, number of refills, payor, and pharmacy that received prescription.

Results:

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

Conclusions:

Conclusions will be presented at the Ohio Pharmacy Resident Conference.

Diagnostic Stewardship: Impact on Time to Optimal Therapy in Patients with Staphylococcus aureus Infections Using the Penicillin-Binding Protein 2a Assay

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UAN: 0048-0000-24-036-L01-P

Learning Objectives:

1. Recall current rapid diagnostic tools routinely used for diagnosis of bloodstream infections.
2. Discuss the potential role of penicillin-binding protein 2a assays in rapid identification of alternative sources of infection for Staphylococcus aureus.
3. Review the results of this study and the impact in may have on patient care.

Purpose:

Rapid diagnostic tools are routinely utilized for identification and diagnosis of infections with sources such as bacteremia and meningitis, however, there are not rapid diagnostic tools for sources such as sputum, wounds and urine. The purpose of this study is to evaluate the impact of penicillin-binding protein 2a (PBP2a) assays as a rapid diagnostic tool in the treatment of Staphylococcus aureus infections. There have been few studies to evaluate potential benefit of this tool. By filling the gap in literature, completion of this study can promote further research and pave the way for health systems to implement this tool in antimicrobial stewardship practices. By evaluating time to appropriate antibiotic therapy, the benefit of this test can be evaluated for its potential role in decreasing broad spectrum antibiotic resistance, length of hospital stay, and hospital readmission rates.

Methods:

This study is a single site, retrospective, observational study design, completed at a rural, community hospital. The data collection will include patient characteristics, interventions and clinical outcomes of patients with Staphylococcus aureus infections that were hospitalized and received treatment from July 1, 2022 to June 30, 2023. The primary endpoint of this study is time to appropriate antibiotic therapy in hours, analyzed for statistical significance using parametric T-test. The secondary endpoints are length of hospital stay, hospital readmission, and correlation of PBP2a assays to nasal methicillin resistance Staphylococcus aureus (MRSA) PCR. These endpoints will be evaluated for statistical significance using Mann-Whitney U-Test, Chi-square test, and logistic regression analysis, respectively. Patients will be excluded if they are less than 18 years of age, are immunocompromised, have polymicrobial infections, cultures not collected within twenty-four hours of initiation of antibiotics, do not require antibiotic treatment or have left against medical advice.

Results:

Data collection in progress.

Conclusions:

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

A Retrospective Analysis of Buprenorphine Induction Strategies on Treatment Initiation and Completion Rates in Hospital Inpatients with Opioid Use Disorder

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UAN: 0048-0000-24-037-L08-P

Learning Objectives:

1. Review the mechanism of action of buprenorphine in opioid use disorder
2. Discuss the benefits of a buprenorphine micro induction in opioid use disorder

Purpose:

Buprenorphine is an FDA approved treatment for opioid use disorder (OUD) traditionally used first-line. Buprenorphine exerts partial mu opioid receptor agonism with high receptor affinity making it capable of displacing full mu opioid agonists and precipitating withdrawal. Standard buprenorphine induction requires the patient to discontinue other opioids and develop opioid withdrawal before buprenorphine administration. A micro induction of buprenorphine utilizes smaller initial doses to prevent precipitated withdrawal and also allows for continuation of other opioids for pain management. The purpose of this study is to analyze the effectiveness of a micro induction dosing strategy in patients initiating buprenorphine treatment. This study compares rates of patients who discharge against medical advice (AMA) as a marker of incomplete initiation onto buprenorphine.

Methods:

This retrospective study evaluated two groups of inpatients from both detox and medical units initiated on buprenorphine at Summa Health System - Akron Campus from October 31 2022, to December 20 2023. The micro induction group (n=17) included patients who received at least one partial buprenorphine +/- naloxone 2mg/0.5mg film (0.25 or 0.5). The standard group (n=17) included patients initiated on buprenorphine +/- naloxone with standard starting dose of 2mg/0.5mg or 4mg/1mg. The study included patients >18 years old. Patients who had received a dose of buprenorphine within 30 days of admission were excluded. The primary outcome was the incidence of patients leaving AMA vs. routine discharge with or without a prescription for buprenorphine in opioid tolerant patients receiving buprenorphine micro induction on compared to standard initiation. A chi squared test was used for the primary outcome. Testing was two-sided with statistical significance defined as $p<0.05$.

Results:

In the micro induction group, 17.6% of patients left AMA vs. 29.4% in the standard induction group ($p=0.688$). Length of stay increased in the micro induction group at a median of 10 days vs. 4 days in the standard induction group ($p=0.001$). Prior to the initiation dose, the median inpatient oral morphine equivalents received was 54mg in the micro induction group vs. 0mg in the standard induction group ($p<0.001$).

Conclusions:

Micro induction with buprenorphine did not increase the rate of patients leaving AMA when compared with standard induction. The information is valuable when providers are determining the most suitable induction method to ensure inpatients with OUD and comorbid pain, recent surgery or escalation of disease processes are not lost to follow up.

Time to sedation following paralytic for intubations in the emergency department

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UAN: 0048-0000-24-038-L01-P

Learning Objectives:

1. Review medications commonly used during the rapid sequence intubation process
2. Identify opportunities for optimization of post-intubation sedation and analgesia

Purpose:
To assess if there is a difference in time to analgesia or sedation (A/S) post-rapid sequence intubation (RSI) for patients receiving succinylcholine versus rocuronium in the emergency department (ED) and to determine if involvement of an emergency medicine (EM) pharmacist impacts time to A/S.

Methods:
This cohort study was conducted by retrospective chart review between the dates of 8/1/2021 to 7/31/2023. Patients 18 years of age or older who underwent RSI in the ED at various OhioHealth locations were included. Patients received either succinylcholine or rocuronium as a paralytic prior to intubation. Exclusion criteria included patients intubated prior to arrival to the ED, having received vecuronium in the ED, hemodynamically unstable patients defined as a systolic blood pressure less than 90 mmHg prior to RSI, having received sugammadex during patient stay, cardiac arrest prior to RSI, or having presented to the ED on a weekend or holiday.

Results:
Three hundred and forty-one patients were screened to collect the 258 patients required to meet power for this study. The succinylcholine group and the rocuronium group each included 129 patients. There was not a statistically significant difference from time of intubation to time of initial A/S between patients receiving succinylcholine vs. rocuronium (16.7 ± 29.5 minutes vs. 19.8 ± 27.9 minutes, $p = 0.329$). For the time from initial A/S to titration, there was a significant difference between patients receiving succinylcholine vs. rocuronium (31.7 ± 60.5 minutes vs. 63.8 ± 85.8 minutes, $p < 0.001$). The presence of an EM pharmacist was not statistically significant on time to A/S ($p=0.304$ and $p=0.645$ respectively).

Conclusions:
The time from initial A/S to titration and the total time from intubation to A/S titration was significantly shorter in patients that received succinylcholine compared to rocuronium. This study was not powered to assess for the impact of pharmacist presence on time to A/S; however, there was less variation in the times when an EM pharmacist was present. Similar studies would need to be conducted in the future to power and assess for the impact of EM pharmacist presence.

Evaluation of Insulin Administration for Diabetic Ketoacidosis in a Community Hospital

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Preceptors: Colton Hill PharmD, BCPS, Hannah Hixenbaugh PharmD, BCPS, Jodie Fink PharmD, BCPS

UAN: 0048-0000-24-039-L01-P

Learning Objectives:

1. Review the current standard treatment regimen of diabetic ketoacidosis at University Hospitals Ahuja Medical Center
2. Discuss results, next steps, and conclusions of the residency project

Purpose:

The usual management of diabetic ketoacidosis (DKA) initially requires intensive critical care unit (ICU) level of care due to frequent monitoring and dose adjustments of insulin infusions. However, several studies have shown that treating mild DKA outside the ICU with rapid-acting subcutaneous (SQ) insulin administration decreases ICU admissions as well as costs that are associated with DKA. Based on these findings, the emergency department and ICU staff at University Hospitals (UH) Ahuja Medical Center have adopted the use of SQ rapid acting insulin in the mild DKA population at our institution. In order to safely and effectively implement this process, we must first understand baseline information on our DKA patients at UH Ahuja Medical Center. The objective of this chart review is to characterize information about the treatment of DKA.

Methods:

This was a retrospective, single-center, IRB approved chart review of patients admitted to UH Ahuja Medical Center for DKA between November 1, 2022 and October 31, 2023. Patients 18-89 years old with diagnosis of DKA confirmed by the following laboratory parameters were included: pH ≤ 7.3, serum bicarbonate ≥ 15 mmol/L, glucose ≥ 250 mg/dL, and anion gap > 10 mmol/L. Patients were excluded if they presented with a heart failure exacerbation, acute myocardial infarction, persistent hypotension (SBP < 80 mmHg) after administration of ≥ 1 L of bolus fluid, serious concomitant infection, pregnancy/ breastfeeding, or altered mental status/loss of consciousness. The primary endpoint of this chart review was to assess the time to DKA resolution (hours) based on the severity of DKA the patient experienced. The secondary endpoints examined ICU length of stay (hours), hospital length of stay (hours), hypoglycemic episodes (blood glucose < 60 mg/dL), and amount of insulin needed until DKA resolution (units). Descriptive statistics will be utilized for both primary and secondary endpoints.

Results:

The results will be presented at the 2024 Ohio Pharmacy Residency Conference.

Conclusion:

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

Effect of Time to Therapeutic Vancomycin Area Under the Curve on Clinical Outcomes in Hospitalized Patients with MRSA Pneumonia

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Shannon Olson, BSPharm, BCIDP; Alex Huang, PharmD; Marco Scipione, PharmD, BCPS-AQ-ID; Jing Zhao, PharmD

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Learning Objectives:

1. Evaluate the relationship between time to therapeutic vancomycin AUC/MIC and clinical outcomes in hospitalized patients with MRSA pneumonia
2. Define optimal vancomycin duration of therapy for MRSA pneumonia, whether 7 total days of therapy is adequate regardless of time to therapeutic vancomycin AUC/MIC or if duration of therapy should be extended from time to therapeutic vancomycin AUC/MIC achievement

Purpose:

Current monitoring of vancomycin (VAN) for clinical success is the VAN area under the curve to minimum inhibitory concentration (AUC/MIC) ratio, with a goal range of 400-600. Regardless of reaching a therapeutic AUC, the time VAN is administered is included in the total duration of therapy. The purpose of this study is to evaluate the relationship between time to therapeutic AUC/MIC and clinical outcomes in hospitalized patients with MRSA pneumonia to determine whether 7 total days of therapy is adequate regardless of time to therapeutic vancomycin AUC/MIC or if duration of therapy should be extended from achieving therapeutic AUC/MIC.

Methods:

This study will be conducted through a retrospective chart review of existing electronic medical records from November 1, 2011 to August 31, 2022 at Detroit Medical Center inpatient facilities (Detroit Receiving Hospital, Harper-Hutzel Hospital, Huron Valley Sinai Hospital, and Sinai-Grace Hospital). The primary outcome will be a composite 7-day clinical response defined as improvement in signs and symptoms of infection (i.e., decreased respiratory secretions or improvement in oxygen requirement), absence of fever for 24 consecutive hours after VAN initiation, and normalization of WBC (4,000 – 11,000 cells/mm3) in immunocompetent patients. Secondary outcomes will include incidence of mechanical ventilation and ventilator days, ICU and hospital length of stay, microbiologic cure, 30 –day MRSA pneumonia recurrence, and 30-day all-cause mortality. Inclusion criteria will include adult patients aged ≥ 18 and ≤ 89 years old, culture-confirmed MRSA pneumonia, and received at least 7 days of VAN therapy for MRSA pneumonia. Exclusion criteria will exclude protected populations (< 18 and > 89 years old, inmates), death within 48 hours of index culture, patients who received VAN dosing less frequent than every 24 hours (e.g., every 48 hours), patients lacking a steady state VAN trough, necrotizing or cavitary pneumonia, lung abscess or empyema, polymicrobial pneumonia, concomitant pneumonia, extra-pulmonary sites of MRSA infection, and patients on any type of renal replacement therapy.

Results:

Results will be presented at the 2024 Ohio Pharmacy Residency Conference.

Conclusions:

Conclusions will be presented at the 2024 Ohio Pharmacy Residency Conference.

Assessment of Pharmacists' Knowledge of Dispensing Emergency Refills

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UAN: 0048-0000-24-041-L04-P

Learning Objectives:

1. Review the current law on dispensing emergency refills in Ohio
2. Identify patients who are eligible for receiving an emergency refill in Ohio
3. Discuss the pharmacists' impact of dispensing emergency refills on patients

Purpose:
Often times, it takes several days or even longer for patients and their pharmacies to hear back from providers' offices on medication refill requests. To combat this issue, laws allowing pharmacists to dispense emergency refills in certain situations exist. Despite these laws that are designed to help prevent patients from going without maintenance medications, interruptions in therapy still occur due to underutilization of emergency refills due to pharmacists' unfamiliarity with the law in addition to the inability to get in contact with the prescriber. This study is being conducted on community pharmacists who are embedded in a federally qualified health center (FQHC) in northeast Ohio. It aims to assess the practice site's pharmacists' knowledge of dispensing emergency refills as well as to determine if there is a change in their knowledge before and after implementation of a protocol outlining the use of emergency refills.

Methods:
In this prospective study, eight pharmacists completed a 15-question assessment to obtain baseline knowledge on emergency refills in Ohio. The questions evaluated pharmacists' knowledge and application skills of the appropriateness of issuing emergency refills in specific scenarios as well as documentation. After completion of the questionnaire, pharmacists received training on the practice site's protocol outlining procedures for the determination, documentation, and billing of dispensing emergency refills by pharmacists. The same questionnaire was then taken by the pharmacists to assess post-training knowledge on emergency refills. The pre- and post-training scores were tracked, and each pharmacist's paired scores were evaluated using descriptive statistics to measure percent change.

Results:
The mean pre- and post-training scores were 42.5% and 81.7%, respectively. The mean percent change between pre- and post-training scores was 163% and the mean number of answers changed from incorrect to correct was 6.4.

Conclusions:
This is the first study to assess pharmacists' knowledge of dispensing emergency refills with a comparison of before and after receiving education on the topic. Assessing baseline knowledge was helpful in identifying gaps in knowledge, and training allowed for improvement in areas of deficiency as evidenced by an increase in assessment scores. This study suggests pharmacists, regardless of experience, may have some lack of knowledge on what the law requires when issuing emergency refills. A limitation of this research was the small sample size. Perhaps further investigation on a statewide or even national level may reveal similar results. Results from this study may help bring awareness to pharmacists' ability to dispense emergency refills and help pharmacists feel more confident when issuing them. This may lead to more appropriate emergency refills being issued and better adherence to medications.

Evaluation of dapagliflozin versus empagliflozin in heart failure with reduced ejection fraction

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UAN: 0048-0000-24-042-L01-P

Learning Objectives:

1. Identify the role of sodium-glucose cotransporter-2 inhibitors (SGLT2i) in heart failure with reduced ejection fraction
2. Discuss the impact of dapagliflozin and empagliflozin on cardiovascular outcomes

Purpose:
Despite available research examining the cardiovascular benefits of sodium-glucose cotransporter-2 inhibitors (SGLT2i) dapagliflozin and empagliflozin in patients with heart failure, direct comparisons of the two agents are lacking. The purpose of this study was to compare the efficacy of dapagliflozin versus empagliflozin for the treatment of heart failure based on the need for readmission in patients newly initiated on either SGLT2i.

Methods:
This was a retrospective chart review of adult patients with heart failure with reduced ejection fraction (HFrEF) newly initiated on either dapagliflozin or empagliflozin and admitted to a large academic medical center between January 1, 2023 and June 30, 2023. The primary efficacy outcome was 30-day all-cause readmission. Secondary 30- and 90-day outcomes included all-cause mortality, a composite of major adverse cardiovascular events (MACE), change in ejection fraction, and readmission due to heart failure. All cause readmission at 90 days was also evaluated.

Results:
A total of 83 patients met study criteria (24 dapagliflozin group, 59 empagliflozin group). Only patients receiving empagliflozin were readmitted within 30 days of discharge, none receiving dapagliflozin [13 (15.7%) vs 0, p=0.012]. At 90 days, seven patients in the dapagliflozin group and 20 in the empagliflozin group were readmitted (29.2% vs 33.9%, p=0.676). All-cause mortality at 30 and 90 days was observed only in the empagliflozin group (n=2; 2.4%). No difference in MACE was observed between groups at 30 and 90 days. Readmission for heart failure at 90 days occurred in two patients in the dapagliflozin group and eight in the empagliflozin group (8.3% vs 13.6%, p=0.51).

Conclusion:
In this study, a difference between dapagliflozin and empagliflozin was observed at 30-day readmission but not for readmission for heart failure. Additional head-to-head trials are needed to determine if there is a difference in cardiovascular outcomes between dapagliflozin and empagliflozin.

The Impact of an Ambulatory Care Elective: Evaluating Student's Perceptions and Entry-Level Competencies Post-Ambulatory Care APPE

Stefania Cian, PharmD, PGY2 Pharmacy Resident at Harper University Hospital, MI
Candice Garwood, PharmD, BCACP, BCPS; Amber-Lanae Martirosov, PharmD, BCPS; Allison Lobkovich, PharmD; Helen Berlie, PharmD, BCACP; Francine Salinitri, PharmD

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Learning Objectives:

1. Review current literature on the development of ambulatory electives in the pharmacy curriculum
2. Discuss how ambulatory care electives can prepare students with the necessary skills and knowledge for success in the ambulatory care practice setting

Purpose:

The purpose of this study is quality improvement. This study will assess a new ambulatory care elective entitled "Advanced Topics in Ambulatory Care" on the impact on students' self-perceptions of competency with entry level skills crucial for their required fourth year ambulatory care rotation. It aims to demonstrate that students enrolled in the ambulatory care elective are better prepared to perform on their APPE (Advanced Pharmacy Practice Experience) ambulatory care rotation. The study seeks to identify areas of strength and areas of improvement in the course and evaluate its influence on future pharmacy curriculum certificate programs and fourth year rotations.

Methods:

This is a retrospective cohort study between the period of January 2022 – May 2023. Students will have completed post ambulatory care elective Qualtrics surveys, APPE ambulatory care rotation(s), and APPE self-evaluations. Preceptors will have completed APPE evaluations of the student and provided additional reflective comments in the evaluation. Participants will be identified by the course enrolment list for the Ambulatory Care Elective in Winter 2022 or using preceptors who were assigned to the original 22 students. Participants in the control group will be identified and randomly selected from the fourth-year class list who did not participate in the ambulatory care elective. Continuous and categorical variables will be expressed with frequency distributions (n, %). Nonparametric (Mann-Whitney U, Wilcoxon signed-rank, and Friedman) tests will be used to analyze categorical variables. All data with a p-value ≤ 0.05 will be considered to indicate statistical significance. Additionally, a thematic analysis of de-identified reflections and free-text responses will occur using the Miles and Huberman method.

Results:

Results will be presented at the 2024 Ohio Pharmacy Residency Conference.

Conclusions:

Results will be presented at the 2024 Ohio Pharmacy Residency Conference.

Utilization of the STOP-IT Trial for Intra-abdominal Infection Management

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Shelby Anderson, PharmD

UAN: 0048-0000-24-044-L01-P

Learning Objectives:

1. Review trial of Study to Optimize Peritoneal Infection Therapy (STOP-IT)
2. Evaluate OhioHealth Mansfield's Hospital duration of antibiotics for complicated intra-abdominal infections
3. Analyze results of the utilization of four-day stop dates intervention/education document

Purpose:

The *Study to Optimize Peritoneal Infection Therapy (STOP-IT)* trial compared four days of antibiotic therapy after a source control procedure with a seven day duration. The study's results showed no difference between the two groups, leading to the conclusion that a shorter duration of treatment for complicated intra-abdominal infections is favored. OhioHealth Mansfield's utilization of the STOP-IT trial is unknown.

Methods:

This was a retrospective cohort study from December 2022 to March 2024 utilizing an intervention/educational document summarizing the STOP-IT trial to help healthcare providers identify patients for whom a four-day duration of antibiotics after source control would be appropriate. The study included patients diagnosed with a complicated intra-abdominal infection who have achieved source control. ICD-10 codes were utilized to identify the patient group using chart review. The primary outcome measure is the percentage change of patients whose antibiotics were given four day durations. The secondary outcome measure is the cost savings of a four-day duration of antibiotics compared to previous prescribing durations.

Results:

Full results will be presented at Ohio Pharmacy Resident Conference with presentation.

Conclusion:

Conclusion will be presented at Ohio Pharmacy Resident Conference with presentation.

Evaluation of hemorrhagic conversion in patients receiving tenecteplase for acute ischemic stroke within five regional health system hospitals

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Lauren Gressel, PharmD, BCCCP; Holly McCrystal, PharmD, BCPS

UAN: 0048-0000-24-045-L01-P

Learning Objectives:

1. Review the current recommendations for the use of thrombolytics in management of acute ischemic stroke
2. Discuss the risks and benefits of using thrombolytics in acute ischemic stroke

Purpose:

Numerous health systems across the country have recently converted their preferred thrombolytic for acute ischemic stroke (AIS) from alteplase to tenecteplase. Data from non-inferiority trials has suggested comparable efficacy and outcomes with tenecteplase, and potential superiority in large vessel occlusion (LVO). Providing additional advantage is the faster onset, longer half-life, as well as simpler dosing and administration of tenecteplase. Tenecteplase is currently not approved by the Food and Drug Administration for treatment of AIS but is recognized by major guidelines as a potential alternative to alteplase in certain situations. Use of thrombolytics confers an increased risk of bleeding and conversion of ischemic stroke to hemorrhagic stroke. The purpose of this study is to explore this safety endpoint at Mercy Health facilities within the Cincinnati area.

Methods:

This was a retrospective study of patients admitted to five regional Mercy Health hospitals within the Cincinnati area who received tenecteplase for AIS between August 1st, 2022, and July 31st, 2023. The objective of this study was to evaluate the rate of hemorrhagic conversion in patients with acute ischemic stroke following administration of tenecteplase. Hemorrhagic conversion was defined as an increase in NIHSS score of 4 or more points with confirmation by imaging. Included patients were 18 years or older, had a clinical diagnosis of acute ischemic stroke, who received doses of 0.25 mg/kg of tenecteplase within 4.5 hours of symptom onset (maximum total dose of 25 mg). Other patient data collected included NIHSS scores throughout admission, peri-treatment blood pressures, pertinent past medical history, anticoagulant or antiplatelet use, and smoking history.

Results:

One hundred fifty-nine patients were included in this study. The primary endpoint of hemorrhagic conversion of acute ischemic stroke occurred in 13 patients, or about 8% of the patients who received tenecteplase.

Conclusions:

Full conclusions to be presented at OPRC. Initial analysis suggests a similar rate of hemorrhagic conversion after tenecteplase as has been described in previous studies and is comparable to that of alteplase.

Pre vs. Post Cefazolin Prescribing in Patients with Penicillin Allergy Labels Undergoing Cardiac Device Implantation Procedures with an Order-Set Change

Kelly Craft, PharmD – UC Health West Chester Hospital Department of Pharmacy
Adam Clemens, PharmD; Tara Harpenau, PharmD, BCIDP

UAN: 0048-0000-24-046-L01-P

Learning Objectives:

1. Describe previous strategies shown in medical literature to increase cefazolin use in patients with a penicillin allergy label for surgical prophylaxis.
2. Select an appropriate therapy for cardiac device procedure surgical prophylaxis in patients with penicillin allergy labels.

Purpose:
Cefazolin is recommended first-line for surgical site infection (SSI) prophylaxis in cardiac device implantation procedures. Despite abundant safety data for cefazolin use in patients with penicillin allergy labels, second-line agents like clindamycin and vancomycin are still used. Minimal data exists evaluating the impact of order-sets on cefazolin prescribing patterns. This study evaluated the change in cefazolin prescribing following a cardiac device pre-procedural order-set change to recommend cefazolin in patients with a penicillin allergy label.

Methods:
This was a single-health system retrospective cohort study approved by the Institutional Review Board. An order-set for cardiac device implantation procedures was updated to recommend cefazolin for SSI prophylaxis in patients with a penicillin allergy label. Written education was provided to clinical staff. Patients ≥ 18 years of age with a documented penicillin allergy label, and had an order placed from the order-set were included. The primary outcome was incidence of cefazolin prescribing, comparing the pre-group (1/1/2023-5/31/2023) and post-group (8/1/2023-12/31/2023). Selected secondary outcomes included incidence of SSIs and adverse drug reactions. Continuous data utilized a t-test and categorical data utilized Chi-square or Fisher's exact test.

Results:
After screening 473 patients, 40 were included (20 in pre-group, 20 in post-group). Most patient's allergy descriptions were type I (42.5%) or type IV (32.5%). Cefazolin was prescribed in 2 pre-group patients (10%) compared to 15 post-group patients (75%) ($p<0.001$). No SSIs occurred in patients who received cefazolin, compared to 2 patients (7%) who received alternative antibiotics ($p=0.545$). No study patients experienced any adverse drug reactions.

Conclusions:
A change in the order-set for cardiac device implantation procedures with education was effective to increase cefazolin prescribing in patients with penicillin allergy labels. Cefazolin was shown to be safe and effective, consistent with previous literature. Order-set changes combined with education could be beneficial for other surgical procedures to increase cefazolin use.

Time for a Pulse Check: Assessing Value of QTc Medication Interventions by Pharmacists

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Jessica Fowle, PharmD, BCPS; Sara Jordan Hyland, PharmD, BCCCP; Adam Trimble, PharmD, BCPS

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Learning Objectives:

1. Recognize the variety of risk factors associated with QTc prolongation
2. Review the Tisdale score and its role in clinical decision making

Purpose:

The QTc interval is an important electrocardiography measurement representing the time from ventricular depolarization through repolarization. Certain medications are known to prolong the QTc interval and may increase the risk of ventricular arrhythmias. Many factors should be considered when altering medication regimens to reduce this risk. This project aims to characterize the value of pharmacist interventions related to QTc-prolonging medications by applying an evidence-based framework.

Methods:

This project was reviewed by the institutional office of human subject's protections as a quality improvement determination. All documented pharmacist interventions (i-Vents) made system-wide from 01/01/21-01/01/24 on ondansetron, furosemide, haloperidol, and fluconazole were assessed. The i-Vents were randomized and reviewed manually to identify those directed at QTc prolongation. The value of the pharmacist's intervention was determined by the change in the patient's Tisdale score which is a validated tool for quantifying a patient's risk of clinically meaningful QTc prolongation.

Results:

In total, 35 interventions were included in the analysis, and each intervention was made on a unique patient. All interventions analyzed were related to ondansetron and fluconazole. Thirty-one (88.6%) interventions were on patients who were in the low Tisdale risk category prior to the intervention and had no discernible clinical benefit based on the applied framework. Two (5.7%) interventions lowered a patient's Tisdale risk category, and two (5.7%) interventions identified patients in the moderate Tisdale risk category that warranted appropriate monitoring, but did not impact their score.

Conclusions:

When assessing patient risk for QTc prolongation, pharmacy services at OhioHealth frequently intervene without significantly lowering patients' risk of prolonged QTc. These results suggest the need for targeted education or electronic medical record (EMR) adjustments. One opportunity would be the addition of a Tisdale score calculator into the EMR to create greater visibility into patient risk and guide appropriate interventions.

Evaluation of Perioperative Antimicrobial Stewardship Practices in Kidney Transplantation

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UAN: 0048-0000-24-048-L01-P

Learning Objectives:

1. Discuss antimicrobial stewardship practices in kidney transplantation
2. Review the incidence of infection, graft loss, and mortality for standard versus non-standard perioperative antibiotic use in kidney transplantation

Purpose:

Kidney transplantation is a highly successful treatment for patients with end-stage renal disease; however, post-transplant infections remain a major concern due to risk of graft dysfunction, rejection, and increased risk of mortality. Immunosuppressive therapy increases the vulnerability of various pathogens prompting providers to prescribe additional prophylaxis without appropriate evidence. This adds to the growing concern about over prescription of antibiotics and emergence of resistant bacteria. Despite many studies regarding post-transplant infections and antimicrobial stewardship practices, there are no definitive guideline recommendations for transplant centers that combine both principles of safety and efficacy of additional treatment.

Methods:

This retrospective, single-center cohort study included patients admitted to the University of Toledo Medical Center who received a kidney transplant between October 1, 2022, through May 30, 2023. Patients younger than 18 years old or pregnant were excluded from the study. Patients were divided into two groups: standard perioperative antibiotic treatment (cefazolin) and non-standard treatment (non-cefazolin). The primary objective was evaluating the incidence of infection within 30 days of transplantation between groups. Secondary endpoints include assessment of multi-drug resistant (MDR) organisms, total days of antimicrobial therapy received, incidence of C. difficile, 30-day graft loss and mortality between groups.

Results:

143 out of 145 patients reviewed met inclusion criteria. 120 patients (83.9%) received standard perioperative antibiotic treatment (cefazolin) and 23 patients (16.1%) received non-standard treatment (non-cefazolin). There were lower incidences of antibiotic allergies in the standard (8.3%) versus non standard (47.8%) treatment groups. There were less outpatient antibiotic prescriptions in the standard (27.5%) versus non-standard (65.2%) group. Further data analysis is ongoing and will be presented at the 2024 Ohio Pharmacy Residency Conference.

Conclusions:

Final conclusions will be presented at the 2024 Ohio Pharmacy Residency Conference.

Incidence of Venous Thromboembolism in Bariatric Surgery Patients in a Community Hospital Setting

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UAN: 0048-0000-24-049-L01-P

Learning Objectives:

1. Review current recommendations for pharmacologic venous thromboembolism (VTE) prophylaxis in bariatric surgery patients.
2. Evaluate medication, dose, and duration of VTE prophylaxis prescribed on discharge for patients receiving bariatric surgery at a community hospital.
3. Identify incidence of bleeding and VTE thirty days post-discharge in bariatric surgery patients recently admitted to a community hospital.

Purpose:

Patients undergoing bariatric surgery are at an increased risk for venous thromboembolism (VTE), with the incidence of deep vein thrombosis after bariatric surgery ranging from 0.2 to 3%, and the incidence of pulmonary embolism after bariatric surgery ranging from 0.1 to 2%. With VTE prophylaxis protocols in place, many bariatric programs have reached VTE rates of less than 1%. Most bariatric surgery patients are at least moderate risk for VTE events due to severe obesity, undergoing laparoscopic surgery, and perioperative immobility. However, there is a lack of high quality and class I evidence regarding safety, efficacy, dosing, and duration of treatment for thromboprophylaxis in this patient population. Various anticoagulation strategies have been presented using unfractionated heparin or low molecular weight heparin (LMWH), with LMWH being the most commonly prescribed post-discharge thromboprophylaxis. This analysis aims to retrospectively identify the incidence of VTE and bleeding in bariatric surgery patients thirty days post-discharge from a community hospital. This study will compare a group of patients on thromboprophylaxis at discharge to a group on no thromboprophylaxis at discharge.

Methods:

A retrospective chart review was performed for bariatric surgery patients admitted to a community hospital for bariatric surgery from March 1, 2023 to January 15, 2024. Patients were included in analysis if they were 18 years of age and older, had a body mass index (BMI) of 35 to 40 with a comorbidity, or had a BMI greater than 40 with or without a comorbidity. Patients were excluded if they were under eighteen years of age, or had a history of VTE bleeding, or surgery within thirty days prior to admission. The primary endpoint includes incidence of VTE and bleeding events thirty days post-discharge in patients who received post-discharge thromboprophylaxis versus those who did not receive any post-discharge thromboprophylaxis. Secondary endpoints include (1) 30-day patient risk level for post-discharge VTE, (2) analysis of drug, dose, and duration in days of thromboprophylaxis prescribed post-discharge, and (3) a comparison of risk factors for VTE in the two patient groups.

Results:

Results will be presented at the 2024 Ohio Pharmacy Residency Conference.

Conclusions:

Conclusions will be presented at the 2024 Ohio Pharmacy Residency Conference.

Continuous Glucose Monitoring in the Primary Care Setting and the Risk of Diabetic Emergencies

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Learning Objectives:

1. Describe the risk of diabetic emergencies
2. Explain the benefit of continuous glucose monitoring
3. Discuss whether continuous glucose monitoring reduces the risk of diabetic emergencies

Purpose:
To determine if CGM use in patients with type 1 or 2 diabetes reduces the risk of emergency room visits for diabetic emergencies including hypoglycemia, diabetic ketoacidosis, and hyperglycemic hyperosmolar syndrome.

Methods:
This retrospective case-control study compared the risk of diabetic emergencies in diabetic patients that use CGM to those who do not. Patients were included if they were 18 years or older, diagnosed with type 1 or 2 diabetes, had primary care provider within Jefferson Avenue Family Physician practice, and presented to St Vincent's Medical Center Emergency Department between June 2022 to June 2023. Patient charts were reviewed to determine if they used CGM prior to admission and reason for emergency department visit. Descriptive statistics were calculated for demographic data. The primary endpoint was evaluated with an Odds Ratio and 95% CI.

Results:
A total of 40 patients were included for analysis; 20 diabetic emergency patients and 20 non-diabetic emergency patients. There was not a significant reduction in the risk of diabetic emergencies for patients who used continuous glucose monitoring, though the patient who presented for a diabetic emergency utilized continuous glucose monitoring less.

Conclusions:
While a significant decrease in risk of diabetic emergencies was not identified, there was a non-significant difference in the usage of continuous glucose monitoring between those who presented to the emergency room for diabetic emergencies, and those who presented for other causes. Larger patient populations need to be evaluated to determine the true relationship between continuous glucose monitoring and risk of diabetic emergencies.

Effectiveness of a pharmacy resident driven on-call program for patients with community-acquired pneumonia

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Learning Objectives:

1. Review available literature regarding antimicrobial treatment of community-acquired pneumonia
2. Discuss impact of a pharmacy resident driven on-call program on antimicrobial prescribing for patients with community-acquired pneumonia

Purpose:
Our institution implemented a pharmacy resident review of patients admitted to the hospital with community-acquired pneumonia (CAP) as part of the on-call program to improve antimicrobial prescribing (selection, dose, duration, frequency). The purpose of our study was to examine the impact of the CAP review program on guideline concordance.

Methods: This was a retrospective, quasi-experimental study comparing guideline-concordance in adult patients admitted with CAP in the pre-implementation group (January 1st, 2022 to May 30th, 2022) to the post intervention group (January 1st, 2023 to May 30th 2023) that were treated with antimicrobials. Patients in the post-implementation group were included if they were also examined by pharmacy residents. Patients were excluded if they had concomitant infections, were diagnosed with complicated pneumonia, were mechanically ventilated, admitted to the ICU, or transferred to another facility.

Results: A total of 161 patients were included in the analysis, with 85 in the pre-implementation and 76 in the post-implementation group. Baseline characteristics were similar between groups except that patients in the post-implementation group were more likely to have diabetes mellitus. Overall guideline concordance was significantly improved in the post-implementation group (36.5% vs 55.3%, P = 0.017). The improvement was primarily driven by an increase in outpatient guideline concordance (25.7% vs 43.9% P = 0.049) and a reduction in median outpatient duration of therapy (96.0 vs 72.0 hours P = 0.006). However, the median total duration of antimicrobial therapy did not differ between the pre- and post-implementation groups (120.6 hours vs 120.9, P = 0.773).

Conclusions: This study demonstrated a significant improvement in outpatient and overall guideline concordance as a result of the implementation of the pharmacy resident on-call CAP review program. It also improved outpatient duration of antimicrobial therapy.

Association of prophylactic antibiotics with the safety and efficacy of early antibiotic discontinuation in patients with febrile neutropenia with fever of unknown origin

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Learning Objectives:

1. Review current guidelines and literature for the timing of antibiotic discontinuation in patients with febrile neutropenia with fever of unknown origin.
2. Describe safety and efficacy outcomes with early antibiotic discontinuation in those requiring antibiotic prophylaxis prior to a febrile neutropenic episode.

Purpose:
Febrile neutropenia is a common complication for patients receiving chemotherapy that can result in severe or life-threatening infections. Current guidelines differ in their recommendations on how to treat febrile neutropenia with fever of unknown origin. Some guidelines recommend waiting to discontinue intravenous antibiotics until neutrophil counts recover to >500 cells/mm^3 and others recommend discontinuing beforehand if clinically stable. There is no current literature looking at these different approaches with respect to whether or not a patient had received prophylactic antibiotics.

Methods:
In this single center retrospective chart review, adult non-ICU patients were included if they were treated with intravenous antibiotics for febrile neutropenia with a fever of unknown origin between June 1, 2020 – June 30, 2023. Prophylactic antibiotic use was determined from documentation of antibiotics within the previous chemotherapy cycle. The primary objective was to analyze the safety and efficacy of early antibiotic discontinuation based on recurrent fever, new infection after antibiotic discontinuation, 30-day hospital readmission, and 30-day mortality. These outcomes were assessed in patients who did and did not receive prophylactic antibiotic therapy. Characterization of antibiotic regimens was also performed.

Results:
A total of 69 patients were included in the study. There was no statistically significant difference in overall adverse events between those who had antibiotics discontinued before and after neutrophil recovery (55.6% vs 66.7%, p=0.35). Among those who had received prophylactic antibiotics, there was no difference in overall adverse events. However, there was an increase in fever recurrence with early antibiotic discontinuation (26.3% vs 0%, p=0.049) and an increase in readmissions with late antibiotic discontinuation (31.6% vs 68.8%, p=0.03). There was no difference in adverse events in those who had not received prophylactic antibiotics.

Conclusions:
In patients with febrile neutropenia with fever of unknown origin, antibiotic discontinuation prior to neutrophil recovery should be considered if clinically stable.

Early versus late administration of long-acting insulin in adult diabetic ketoacidosis

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Learning Objectives:

1. Explain the pathophysiology of the development of diabetic ketoacidosis (DKA) and insulin's role in management
2. Review the literature describing early administration of subcutaneous long-acting insulin in DKA management and its impact on patient outcomes

Purpose:
Diabetic Ketoacidosis (DKA), an acute condition associated with uncontrolled diabetes, historically treated with continuous IV insulin (CIVI), followed by subcutaneous (SQ) long-acting insulin (LAI) post-CIVI. Emerging data suggest benefits with earlier LAI administration, but results remain inconclusive. This study compares time to DKA resolution with early versus late administration of LAI.

Methods:
This retrospective study evaluated patients admitted to the emergency department from February 19, 2019 to June 30, 2023, who presented with DKA (initial blood glucose of > 250 mg/dL, anion gap > 14 mEq/L, beta-hydroxybutyrate level > 3.8 mmol/L) and received CIVI for a minimum of 12 hours with overlap with SQ LAI. Patients were grouped as early (LAI < 12 hours after CIVI initiation) and late (LAI $\geq$ 12 hours of CIVI initiation). Primary outcome was time to DKA resolution. Secondary outcomes included length of stay and duration of CIVI. Appropriate statistics were used with a p-value of < 0.05 considered significant.

Results:
There were 54 patients included in this study, with 27 in each group. The mean age was 41$\pm$16 years with 59% male. Median DKA resolution time was shorter in the early group (17.6 [13.9-26.8] vs 19.2 [17.1-32.1] hrs, p=0.16). The early group had shorter CIVI duration (19.5 ±10.3 vs 25.6 ±8.4 hrs, p=0.02), while rate of hypoglycemia was higher in the earlier group with 9 (33%) vs 5 (19%).The early group received less IV fluid in the first 36 hours (4.0 ±2.1 vs 5.8 ±2.2 L, p=0.004). No differences were identified with rebound hyperglycemia, hypoglycemia, or length of stay.

Conclusions:
Early administration of SQ LAI did not result in faster DKA resolution. The early intervention group did experience a shorter duration of CIVI therapy and no difference in adverse events.

Implementation of a Systematic Approach to Identify Computed Tomography (CT) Scan Candidates in Current and Former Smokers in a Federally Qualified Health Center (FQHC)

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Learning Objectives:

1. Review the United States Preventative Services Task Force (USPSTF) recommendation for lung cancer screening in current and former smokers
2. Discuss current adherence to lung cancer screening recommendations in a FQHC setting and review methods to improve CT scan completion

Purpose:
Cigarette smoking is the number one risk factor for lung cancer and is linked to about 80% to 90% of lung cancer deaths in the United States. The USPSTF recommends an annual low dose computed tomography (LDCT) screen for lung cancer for individuals 50-80 years old who have at least a 20 pack-year smoking history and currently smoke or have quit within the past 15 years. This study aims to review adherence to the USPSTF guidance for lung cancer screening in a FQHC setting to gauge opportunity for utilizing a team-based approach to improve completion.

Methods:
A retrospective chart review utilizing an electronic health record report identified patients who have completed a smoking cessation visit with the clinical pharmacy team and meet USPSTF recommendations for screening between January 1, 2021, and December 31, 2022. The primary outcome was to determine the percentage of patients indicated for LDCT screening according to the USPSTF recommendation. Secondary objectives include determining: (1) the percent of those patients that have had an order for a LDCT scan placed, (2) the number of LDCT scans completed within one year of order, and (3) the number of patients that have ever completed a LDCT scan screening once criteria was met.

Results:
A total of 42 patients were due for LDCT screening in the study period. Of these patients, 16.7% had an order for LDCT placed, however, none were completed within a year of initial ordering. Additionally, 4.8% of the patients had completed a LDCT scan in their lifetime once the criteria was met.

Conclusions:
Most patients meeting USPSTF recommendations for LDCT were not referred for the procedure and of those referred, the majority did not complete it. There is an opportunity for pharmacists to assist with LDCT completion within a smoking cessation collaborative practice agreement.

Primary Care Medication Monitoring for PrEP Patients: An Analysis of Guideline Compliance

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Learning Objectives:

1. Review the Centers for Disease Control and Prevention (CDC) guidelines for laboratory monitoring for the use of pre-exposure prophylaxis (PrEP) medications.
2. Evaluate adherence to guideline recommended laboratory monitoring for PrEP by primary care providers.
3. Discuss opportunities for increased pharmacist involvement and support in adherence to guideline directed laboratory monitoring for PrEP.

Purpose:
The purpose of this study is to evaluate guideline compliance of laboratory monitoring for patients taking HIV pre-exposure prophylaxis agents seen by primary care providers at an academic internal medicine clinic.

Methods:
This was a single-center, retrospective, cross-sectional study of patients in a general internal medicine clinic at an academic medical center. Patients were identified and included in the study if they were 18 years or older and seen in clinic between 7/31/2020 and 7/31/2023 with one of the following active medications on their medication list: emtricitabine and tenofovir disoproxil fumarate, emtricitabine and tenofovir alafenamide, or cabotegravir. The primary endpoint assessed was adherence to recommended follow-up laboratory monitoring for HIV and sexually transmitted infections (STIs) according to the CDC guidelines for HIV PrEP. Secondary endpoints included evaluating compliance to other guideline suggested laboratory monitoring and vaccinations. Data was collected based on the index date of October 31st, 2023 and the most recent date of completion for each lab was used in reference to the index date.

Results:
Of the 14 patients included in the study, the mean age was 44 years with the majority of patients being male (85.7%), white (64.3%), and non-Hispanic (78.6%). Ten patients (71.4%) were taking emtricitabine and tenofovir disoproxil fumarate, three (21.4%) were taking emtricitabine and tenofovir alafenamide, and one patient (7.1%) was on cabotegravir. Six patients (42.9%) had completed follow-up HIV laboratory monitoring within the previous 3 months from the index date, as recommended. Completion of syphilis testing within the previous 3 months was 28.6%, with completion of gonorrhea and chlamydia at 14.3%.

Conclusions:
This study concluded that patients prescribed PrEP medication did not complete scheduled laboratory testing for HIV and STIs as recommended by the CDC guidelines. This study shows that primary care providers are an essential contact for patients to offer the use of PrEP therapy, however there are opportunities for improvement in ensuring that all patients are being monitored for safety and efficacy of the medication. Future studies may be beneficial to assess the cause for low adherence to laboratory monitoring and provide suggestions to help increase these rates of completion.

COPD Exacerbation Rate Between Dual Combination Inhaler Therapy Compared to Triple Combination Therapy

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Learning Objectives:

1. Define the treatment options in the Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines
2. Interpret the risk factors for chronic obstructive lung disease (COPD) Exacerbation
3. Discuss the potential benefits for the different treatment options for COPD

Purpose:
Patients who have smoked for years are more likely to develop poor health outcomes that can lead to hospitalization and mortality if not properly treated. This study aimed to look at both current and former smokers in the southeastern Ohio and West Virginia area that have a COPD who are either on dual combination therapy (long-acting beta agonists (LABA) and long-acting muscarinic antagonist (LAMA) or inhaled cortical steroid (ICS)) compared to triple combination therapy. Each subgroup will be compared to obtain a better understanding of the benefits for preventing a COPD exacerbation.

Methods:
A retrospective review of electronic medical record (Athena) was performed to identify patients who had a COPD exacerbation from October 2023 to October 2022. The study identified patients who were on either dual inhaler therapy or triple combination inhaler therapy. COPD exacerbations were defined as worsening of sputum production, cough, or breathing that occurs in a less than 14-day interval. This definition included both outpatient and inpatient treatment with acute steroids and/or antibiotics. With the data collected, each patient was categorized based on their COPD inhaler therapy. The primary outcome of this study was to determine if there was a difference in exacerbation rate between the two inhaler groups. A secondary outcome of the incidence of pneumonia between patients on an ICS inhaler compared to non-ICS inhaler were evaluated.

Results:
A total of 1,350 COPD exacerbations were identified over the previous year and were analyzed. Of these exacerbations, 702 were on some combination inhaler therapy before their exacerbation with at least 80% adherence to their inhaler(s). This resulted in 349 unique patients. Of the 349 patients, 176 were on dual combination therapy and 173 were on triple combination therapy. Only two patients were currently on a dual LABA/LAMA combination inhaler. For the secondary outcome of pneumonia, 72 cases were documented who are on some inhaler combination that included an ICS component. 323 exacerbations were in the dual combination inhaler group while 379 occurred with the triple combination group.

Conclusions:
A similar number of patients and exacerbations occurred within both inhaler treatment groups. Due to the lack of LABA/LAMA inhaler use, the secondary outcome of pneumonia could not be properly analyzed. Given the large COPD population in this area, there is an opportunity for pharmacy led COPD clinics to closely monitor high risk patients.

Evaluation of Continuous Glucose Monitoring (CGM) Managed by A Pharmacist Compared to Primary Care Providers (PCP): Impact on Hemoglobin A1c% (HgA1c%)

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Learning Objectives:

1. Evaluate and discuss potential benefits of CGM management by a pharmacist versus primary care providers.
2. Review opportunities for improvement in the evaluation of CGM management completed by a pharmacist versus primary care providers via retrospective chart review.

Purpose:

Diabetes management via finger sticks can be difficult for individuals for various reasons. The use of continuous glucose monitoring (CGM) can help individuals better manage glucose levels by providing continuous feedback with fewer finger sticks. Studies have shown that pharmacist-led interventions utilizing CGM can lead to significant reductions in hemoglobin A1c% and more clinical interventions than physicians. The purpose of this study is to determine if there is a difference in HgA1c% in patients with CGM management by a pharmacist compared to primary care providers in a rural ambulatory care setting.

Methods:

This is a retrospective chart review of patients with diabetes mellitus (types I&II) utilizing CGM to compare glucose control via HgA1c% in patients being managed by a clinical pharmacist compared to primary care providers seen in Adena Health's ambulatory care clinics from November 1st, 2022 through December 31st, 2023. The primary endpoint is the mean change in Hemoglobin A1c% values from baseline. The secondary endpoints include number of hypoglycemic events following initiation of CGM, cost difference of interventions between provider groups, time to goal HgA1c%, hospitalizations due to hyperglycemic events, and difference in time spent with patient between provider groups.

Results:

166 patients were reviewed with 34 patients meeting inclusion criteria. The primary outcome was greater in the control group versus the intervention group, (0.88 vs. 0.49 [p=.241494, CI 95%]), respectively. Patients in the intervention group experienced more hypoglycemic events per patient (1.75 vs. 0.71, [p=.069362, 95% CI]). Patients in the control group had a reduced time to goal A1c (114 days vs. 132.6 days, [p=.347455, 95% CI]). Five patients from each cohort met goal HgA1c. No patients were admitted to Adena Health for the primary diagnosis of hyperglycemia during the study period.

Conclusion:

Additional studies need to be completed with a larger patient sample over a longer period of time to further evaluate the benefit of pharmacist CGM management in the reduction of hemoglobin A1c.

Impact of Pharmacist-Physician Collaboration in Federally Qualified Health Centers

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Learning Objectives:

1. Describe the primary & secondary endpoints
2. Discuss the limitations of this study
3. Evaluate the potential impact on pharmacy practice as it relates to practice advancement

Purpose:
The purpose of this retrospective matched cohort study is to examine the positive impact that pharmacists may have on clinical outcome measures associated with the Uniform Data System (UDS) and Clinical Quality Measures (CQM), specifically in managing patients with chronic diseases, such as diabetes from October 2021 to December 2023. The primary aim of this study is to measure the change in hemoglobin A1C (HbA1C) between the two cohorts. The secondary aim of this study is to measure pharmacist-led interventions by investigating study endpoints.

Methods:
This study included two cohorts (1) patients who received care from a primary care provider and (2) patients who received care from a pharmacist & primary care provider. Cohorts were matched 1:1 based on age (±5 years), gender, race/ethnicity, and baseline A1C. Inclusion criteria included: non-pregnant patients ≥18 years, diagnosis of Type 2 diabetes, A1C ≥9%, & received care during the study period. The primary endpoint was the mean absolute change from hemoglobin A1C (HbA1C) pre- and post-pharmacist engagement and analyzed using t-tests. The secondary endpoints collected from chart review included: completed pharmacist-led diabetes self-management interventions (education, lifestyle changes, & medication adjustments) were categorized and totaled. The number of completed visits & revenue generated (in dollars) as well as adherence using proportion of days covered (PDC) determined using claims data.

Results:
The initial cohort included 32,839 patients, after removing patients not meeting inclusion criteria & matching, n=104 for Cohort 1 & n=19 for Cohort 2, with the average change in A1C being -2.08 and -2.19 respectively. There is no statistical difference in the mean change of A1C between the groups ($p=0.8392$, $\alpha=0.05$), but within the groups, statistical difference is observed with ($p=< .00001$, $\alpha=0.05$) and ($p=0.0488$, $\alpha=0.05$). Pharmacists completed a total number of 40 visits and generated $2,348.65. In each completed visit, the pharmacist provided education in disease state management (n=35), therapeutic lifestyle changes (n=34), added medication (n=5), or adjusted medication (n=11). Adherence pre- and post-pharmacist engagement was 68.9% and 79.5%.

Conclusions:
Based on sample size, there was no statistical significance in the primary outcome between the two cohorts, but statistical significance within the cohorts. This indicates that care received from either the primary care provider alone or the PCP with a pharmacist leads to a significant reduction in A1C. This could potentially free time for the provider to see more complex patients.

Enoxaparin Venous Thromboembolism Prophylaxis Dosing in Critically Ill Underweight Patients

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Learning Objectives:

1. Discuss the background and need for venous thromboembolism (VTE) prophylaxis in critically ill patients.
2. Review current evidence for enoxaparin VTE prophylaxis dosing in underweight patients.
3. Identify possible risks and benefits of different enoxaparin dosing practices in underweight patients.

Purpose:

Optimal dosing of VTE prophylaxis for specific patient populations remains an area of concern as insufficient evidence exists regarding dosing for underweight patients. The purpose of this study is to compare the incidence of major bleeding events in underweight patients given different prophylactic doses of enoxaparin.

Methods:

This is a retrospective analysis performed at multiple hospitals within a single health care system. Patients with a BMI <18.5 kg/m^2 were divided into two groups depending on whether they received at least one prophylactic dose of enoxaparin 30 mg subcutaneously once daily or enoxaparin 40 mg subcutaneously once daily. Underweight adult patients were included if they were admitted to an ICU for at least 48 hours and received at least one dose of enoxaparin for VTE prophylaxis during their ICU admission. The primary aim was to compare the incidence of clinically significant bleeding between dosing strategies. Secondary aims included the incidence of VTE during admission, ICU length of stay, overall hospital length of stay, and all-cause mortality 30 days post-discharge.

Results:

A total of 230 patients met inclusion criteria for this study, with 57 patients in the 30 mg group and 173 patients in the 40 mg group. There was no significant difference in major bleeding events between the two groups (p= 0.494). No significant differences in incidence of VTE (p= 0.814), ICU length of stay (p=0.548), overall hospital stay (p=0.755), or all-cause mortality (p= 0.571) were found between groups.

Conclusions:

No difference was found in clinically significant bleeding between underweight patients receiving VTE prophylaxis with enoxaparin 30 mg once daily or 40 mg once daily. Further studies are needed to evaluate the optimal dosing of VTE prophylaxis with enoxaparin in underweight patients.

Non-Carbapenem β-Lactams for the Treatment of Ceftriaxone-Resistant Enterobacterales Urinary Tract Infections

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Learning Objectives:

1. Discuss guideline recommendations for management of extended-spectrum β-lactamase producing Enterobacterales (ESBL-E) infections
2. Review the efficacy of non-carbapenem β-Lactams for the treatment of ceftriaxone-resistant Enterobacterales urinary tract infections

Purpose:

Extended-spectrum β-lactamase producing Enterobacterales (ESBL-E) are frequent causes of urinary tract infections (UTIs). Limited data suggest that non-carbapenem β-lactams (NCBL) may be an effective alternative to carbapenem use for ESBL-E UTIs. The goal of this study was to evaluate the use of NCBLs for ESBL-E urinary tract infections

Methods:

This is a multicenter, historical cohort study, done by retrospective chart review, comparing the use of NCBLs (ceftriaxone, cefepime, and piperacillin/tazobactam) with meropenem for the treatment of ceftriaxone-resistant Enterobacterales at Ascension Southeast Michigan Hospitals. Data was included from January 1, 2018, to September 30, 2023. Adult patients were included if they had a positive urinalysis (10 or greater white blood cells per high powered field), symptomatic UTI or at least two systemic inflammatory response syndrome (SIRS) criteria, urine culture showing Enterobacterales with ceftriaxone MIC ≥ 2 μg/mL, and received a study antibiotic for at least 48 hours. Patients were excluded if they had concomitant infections (except bacteremia with the same pathogen), carbapenem-resistant Enterobacterales (CRE) identified, were pregnant, or received prophylactic antibiotics. The primary endpoint was treatment failure defined as the composite of: transfer to intensive care unit (ICU), hospice, antibiotic escalation due to lack of response, and in-hospital mortality. Secondary endpoints include 30-day recurrence, rate of *Clostridioides difficile* infection at 30 days, transfer to ICU, hospice, antibiotic escalation due to lack of response, in-hospital mortality, and hospital length of stay.

Results:

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

Conclusions:

Conclusions will be presented at the Ohio Pharmacy Residency Conference.

Impact of Pharmacist-Led Continuous Glucose Monitoring Program on Reduction in A1c in an FQHC

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UAN: 0048-0000-24-061-L01-P

Learning Objectives:

1. Discuss the current guideline recommendations and role of continuous glucose monitors (CGMs) in the management of diabetes
2. Explore the implications of a pharmacist-led CGM program within an FQHC
3. Identify barriers to initiating continuous glucose monitoring programs

Purpose:
Type 2 diabetes is a common and complex disease affecting 37.3 million people in the United States. The use of continuous glucose monitors (CGMs) has been proven to improve patient glycemic outcomes and lower A1c. There is evidence supporting the use of personal CGMs without intervention and the use of professional CGMs with pharmacist intervention. However, there is limited data available regarding the effectiveness of personal CGMs in a pharmacist-led CGM management program. The primary objective of the study was to illustrate the benefit of a pharmacist-led CGM management program in a federally qualified health center (FQHC). The secondary objective of the study was to assess the A1c reduction over time in a pharmacist-led CGM management program compared to the use of a CGM alone.

Methods:
Retrospective chart review was conducted at Family Health Services of Darke County, a federally qualified health centers (FQHC) in Ohio. Family Health Services' electronic health record, Dexcom dashboard, and Freestyle Libre dashboard were utilized to identify patients with a diagnosis of type 2 diabetes, a baseline A1c within 2 months of initiating a CGM, continued use of Freestyle Libre or Dexcom for at least 6 months, A1c measured at 3- or 4-month intervals, and at least 1 pharmacist-led CGM upload appointment. Data collected for each patient included the patient's last name, medical record number, date of CGM initiation, date of baseline A1c, A1c at baseline, 3 months, 6 months, 9 months, and 12 after initiation of pharmacist-led CGM management, number of appointments scheduled for CGM upload, and number of medication interventions made by the clinical pharmacist in the scheduled CGM upload appointments. Descriptive statistics were utilized to determine change in A1c over time.

Results:
The pharmacist-led continuous glucose monitoring program led to a statistically significant reduction in A1c over time. The reduction seen in A1c at each time point studied was two-fold higher in patients participating in the pharmacist-led CGM management program compared to the use of CGMs alone as outlined in the 2023 ADA Standards of Care. The use of collaborative practice agreements allowed for the pharmacists to make an average of 3.82 individualized therapeutic adjustments per patient.

Conclusions:
Clinical pharmacists are in a unique position to use collaborative practice agreements and patient-specific information from CGMs to provide crucial individualized care to improve diabetes outcomes.

Evaluation of rifaximin for prevention of spontaneous bacterial peritonitis

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Learning Objectives:

1. Review the American Association for the Study of Liver Diseases (AASLD) guideline recommendations on spontaneous bacterial peritonitis (SBP) prophylaxis
2. Discuss the role of rifaximin in primary and secondary SBP prophylaxis

Purpose:
Spontaneous bacterial peritonitis (SBP) is an infection associated with cirrhosis and high mortality rates. To prevent the incidence of SBP, the American Association for the Study of Liver Diseases (AASLD) developed guidelines to address antibiotic prophylaxis use. The standard of care (SOC) is ciprofloxacin, levofloxacin, or sulfamethoxazole-trimethoprim for prophylaxis. Rifaximin is an antibiotic commonly used to treat hepatic encephalopathy. This study aimed to evaluate the efficacy of rifaximin against the standard of care in preventing SBP.

Methods:
This retrospective single-system cohort study evaluated efficacy of rifaximin against standard of care (SOC) in preventing SBP. Included patients had cirrhosis with ascites, met criteria for primary or secondary prophylaxis, and documented follow up in 6 months after discharge. The primary endpoint was incidence of SBP. Secondary endpoints included incidence of SBP in the primary prophylaxis and secondary prophylaxis groups and mortality at 6 months.

Results:
A total of 210 patients met inclusion criteria with 67 patients in the rifaximin group and 143 in the SOC group. The primary prophylaxis group consisted of 193 patients and the secondary prophylaxis group consisted of 17 patients. The primary endpoint occurred in 7% of patients receiving SOC and 10.4% of patients receiving rifaximin (P=0.392). There were no significant differences in SBP rates in both prophylactic groups. Death occurred in 48 patients in the SOC group and in 31 rifaximin patients (P=0.063). In the primary prophylaxis group, patients in the SOC group were less likely to be hospitalized (71.4% vs 85%; P=0.042) or experience death (31.6% vs 50.8%; P=0.011). In the secondary prophylaxis group, there were no significant differences in mortality or re-hospitalization.

Conclusions:
This study demonstrated rifaximin did not decrease the incidence of SBP or mortality compared to the SOC group; however, patients using SOC for primary prophylaxis had better mortality outcomes.

Safety and Efficacy of Early Antibiotic Discontinuation in Febrile Neutronic Patients with Fever of Unknown Origin

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UAN: 0048-0000-24-063-L01-P

Learning Objectives:

1. Review current guidelines and literature for duration of antibiotics in instances of febrile neutropenia with fever of unknown origin.
2. Identify instances in which granulocyte colony stimulating factors (G-CSF) can be utilized in patients with malignancy.

Purpose:
Patients presenting with febrile neutropenia require administration of broad antibiotics. In instances of febrile neutropenia with fever of unknown origin (FUO), there is a lack of consensus duration of antibiotics. The Infectious Diseases Society of America recommends continuing antibiotics until neutrophil recovery (neutrophils > 500 cells/mm3) while other guidance recommends discontinuing antibiotics based on clinical improvement rather than neutrophil count. This study evaluated if there was a difference in safety outcomes when discounting antibiotics prior to neutrophil recovery. Results were also assessed for safety in patients using granulocyte colony stimulating factors (G-CSF) prior to admission.

Methods:
This study was a single center retrospective chart review of febrile neutropenic patients with FUO admitted between June 1, 2020 and June 30, 2023 initially treated with IV antibiotics. Patients were considered to have discontinued antibiotics “early” if IV antibiotics were ceased at least one day prior to neutrophil recovery. Safety was assessed using a composite of recurrence of fever, documented infection, hospital readmission, and 30-day mortality.

Results:
Sixty-nine patients met inclusion criteria with 27 (39.1%) having antibiotics discontinued prior to neutrophil recovery. There was no difference in number of composite safety events between groups with 15 events (55.56%) in the early discontinuation group and 28 events (66.67%) in the late discontinuation group (p=0.35). Less than a quarter received GCSF prophylaxis. No patients receiving GCSF experienced recurrent fever, while 10 patients not receiving GCSF prophylaxis had recurrent fever (0% vs 18.9% p=0.06). However, there was no difference in safety outcomes when evaluating GCSF usage and early vs late discontinuation of antibiotics.

Conclusions:
In a patient with febrile neutropenia and FUO, antibiotic discontinuation can be considered prior to neutrophil recovery if the patient is afebrile and clinically stable. Randomized controlled trials should be performed to further investigate potential differences in safety and efficacy between antibiotic discontinuation strategies.

Evaluation of a Smoking Cessation Pharmacy Service in the Ambulatory Setting

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UAN: 0048-0000-24-064-L01-P

Learning Objectives:

1. Discuss current literature surrounding cigarette use and smoking cessation programs
2. Describe implications of quality improvement results for clinic optimization

Purpose:

Pharmacist-led ambulatory care programs are associated with improved patient outcomes across multiple disease states. Smoking remains a major cause of a wide array of preventable diseases. With this in mind, OhioHealth pharmacy services launched smoking cessation as the newest pharmacist-led ambulatory care program. The goal of this quality improvement project is to identify optimization opportunities of the new smoking cessation program, assess the clinic's impact, and explore theoretical billing opportunities for clinical pharmacists in future state.

Methods:

This prospective, quality improvement project was reviewed by the OhioHealth Office of Human Subjects Protections. All smoking cessation encounters provided by the ambulatory care clinical pharmacists from OhioHealth Grant Family Medicine and Doctors Hospital Family Practice between September 2023 and December 2023 were assessed, allowing for a minimum of ten weeks in the program. Adult clinic patients with active cigarette use and no documented smoking cessation pharmacotherapy were assessed for inclusion. Exclusion criteria included active use of smoking cessation pharmacotherapy at enrollment, active E-cigarette use, or pregnancy. Patient demographics, visit data, and clinical data relating to smoking cessation were collected to assess program compliance and clinic impact. The primary outcome measured the change in number of cigarettes smoked per day. Secondary outcomes measured patient visit compliance and clinic barriers. Outcomes data were assessed with descriptive statistics. Barriers to program effectiveness were assessed via a fish-bone analysis and billing opportunities were explored using theoretical cost-effectiveness framework.

Results:

3274 eligible patients were identified, 7 patients received referrals, 7 patients were contacted by pharmacists, 2 patients enrolled in the clinic. No patients completed treatment during in the study period so primary outcomes and billing opportunities could not be assessed. Identified barriers to the program effectiveness included the referral platform, provider awareness, and patient awareness.

Conclusions:

Very low referral rate of limited assessment of pharmacist impact and future billing opportunities in the study timeframe. Proposed clinic optimization to improve patient referral and visit volumes include creating an informatics platform to increase patient visibility and education to providers for service opportunity.

The implementation of Khorana score for venous thromboembolism prophylaxis in oncology patients: A retrospective review

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Learning Objectives:

1. Define the components of the Khorana score.
2. Identify outpatient oncology patients that may benefit from venous thromboembolism (VTE) prophylaxis.

Purpose:

The National Comprehensive Cancer Network guidelines recommend the Khorana score as a tool to assess the clotting risk in patients receiving chemotherapy. The purpose of this study is to evaluate the clinical impact of VTE prophylaxis in patients with a Khorana score of 3 or greater through a pharmacist driven protocol aiming to decrease hospital admissions and improve patient care.

Methods:

Retrospective chart review was completed for patients with a calculated Khorana score from August 1, 2023 to January 31, 2024as documented by pharmacist intervention or the embedded Khorana score tool. Patients were 18 years or older and had a confirmed solid malignancy including: stomach, pancreas, lung, colon, rectum, bladder, breast, kidney, liver, prostate, gastric, gastroesophageal, testicular, renal or lymphoma. The following exclusion criteria applied: hematologic malignancies or abnormalities (ex. Factor V Leiden), history of thrombosis, surgery within 30 days prior to VTE event, pregnant, anticoagulated for indication other than cancer or exclusions to taking anticoagulants. Baseline characteristics collected include age, sex, site received care, provider, prechemotherapy labs (platelet count, leukocyte count, hemoglobin count), EGFR, cancer type, date of cancer diagnosis, stage of cancer (metastatic or non-metastatic), timing to VTE or bleed, medications that increase risk of thrombosis, antiplatelet therapy, Khorana score, insurance coverage, and agent initiated. The primary endpoint evaluated the percentage of pharmacist VTE prophylaxis recommendations accepted in patients with a Khorana score of 3 or greater. Secondary outcomes evaluated the number of bleeding and VTE events, time to bleeding or VTE event, anticoagulant agent initiated, and insurance coverage of recommended anticoagulant.

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

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

Milrinone Use and Complications in Critically Ill Adults With and Without Kidney Failure

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UAN: 0048-0000-24-066-L01-P

Learning Objectives:

1. Describe the pharmacodynamics and potential adverse effects of milrinone in patients with reduced kidney function.
2. Compare outcomes for critically ill patients receiving milrinone infusions between those with reduced and good kidney function.

Purpose:

Milrinone is a phosphodiesterase inhibitor targeting the PDE3 receptor and is commonly used in the adult intensive care unit (ICU) for cardiogenic shock. It is highly protein-bound and the majority of milrinone is eliminated unchanged in urine. These pharmacodynamic qualities reduce the proportion of milrinone dialyzed during renal replacement therapy (RRT). In critically ill adults with shock, kidney failure is common and may substantially prolong the half-life of milrinone as well. Dosing guidelines are not established for patients on RRT, with kidney failure, or with creatine clearance (CrCl) <10 mL/min. We hypothesized that standard dosing of milrinone in patients with reduced kidney would result in more adverse events such as new onset arrhythmias, cardiac arrests, and/or incidence of hypotension compared to patients with good kidney function.

Methods:

This retrospective, cohort study examined patients with cardiogenic shock at Harper Hospital in Detroit, Michigan from January 2018 - December 2023. Patients were included if they were 18 – 89 years old, diagnosed with cardiogenic shock, and received a continuous intravenous (IV) milrinone infusion over 6 hours. Pregnant patients, prisoners, those with hospital admission <24 hours, and those on concurrent dobutamine were excluded. Patients were divided into three groups based on kidney function: poor kidney function (CrCl ≤30 mL/min), moderate kidney function (CrCl 30 - 50 mL/min), and good kidney function (CrCl >50 mL/min). Demographic data, vitals, and serum creatinine were collected. In-hospital data included the incidence of new-onset arrhythmias, hospital length of stay (LOS), ICU LOS, mortality, inpatient cardiac surgery, use of mechanical circulatory support (MCS), baseline ejection fraction (EF), pressor requirements, and incidence of code blue. Information about medications important to the study was also collected. Our primary outcome was the incidence of new-onset arrhythmias lasting >30 seconds or requiring intervention. Secondary outcomes included hospital LOS, ICU LOS, number of patients who were alive and ICU-free at 28 days, incidence of cardiac arrest while on milrinone, mortality, and hypotension (characterized by increased VIS). For the statistical analysis, descriptive statistics were used for all variables, as appropriate. For continuous variables, mean, median, standard deviation and interquartile range were used as appropriate. The student's t-test and ANOVA were used to compare continuous data. Categorical data used total counts, percentages, and the Chi-Square test and/or Fisher Exact test, as appropriate.

Results:

Will be presented at the 2024 Ohio Pharmacy Residency Conference.

Conclusions:

Will be presented at the 2024 Ohio Pharmacy Residency Conference.

Evaluation of Patients Enrolled in the Summa Anticoagulation Management Service (SAMS) Clinic INR Self-Testing Program

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Learning Objectives:

1. Identify the effect of self-testing on INR time in therapeutic range
2. Discuss the safety outcomes in patients with self-testing

Purpose:
Anticoagulation with warfarin therapy reduces thromboembolic complications in patients with various conditions. Warfarin has a narrow therapeutic range and several factors influence its efficacy, which requires frequent laboratory monitoring of the international normalized ratio (INR). INR self-testing is one way to relieve the burden patients may experience with frequent office visits. Previously conducted studies have shown positive results of self-testing at other institutions. The objective of this quality improvement project is to assess the safety and efficacy of INR self-testing when compared to in-person INR checks within the SAMS clinic.

Methods:
This single-center, retrospective quality improvement project identified patients on warfarin managed by the SAMS clinic for at least 90 days prior to enrollment in the self-testing program who were enrolled as of March 2023. All information was collected via chart review and patients were excluded if they were < 18 years old, not managed by SAMS for > 30 days due to an extended hospital stay or admission to a nursing facility or had a goal INR range other than 2-3 or 2.5-3.5. The primary outcome was the difference in time in therapeutic range (TTR) before and after enrollment in the SAMS clinic self-testing program. Data summaries for the entire cohort were performed along with demographics and baseline characteristics. Comparisons of before and after intervention data included: incidence of thrombotic events, major bleeding events, and a repeated measures analysis of TTR and number of measurements at baseline, 3 months, and 6 months post-baseline.

Results:
A total of 138 patients were screened for data collection and 67 patients met inclusion criteria. TTR increased from baseline by 3.3% at 3 months post-enrollment in the self-testing program ($p = 0.017$) and 7.12% at time of project enrollment ($p = 0.001$), which was at initiation of data collection in December 2023. The difference in TTR across the 3 time periods was not significant ($p = 0.058$). The paired incidence of major bleeding and major thrombotic events were equivalent before and after self-testing.

Conclusion:
Patients enrolled in the SAMS Clinic INR self-testing program experienced a statistically significant increase in TTR by 3.3% at 3 months ($p = 0.017$) and 7.12% ($p = 0.001$) at time of project enrollment compared to before enrollment in the SAMS Clinic INR self-testing program. This data supports that INR self-testing is safe and effective.

The Safety and Efficacy of Enoxaparin on Laparoscopic Sleeve Gastrectomy

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UAN: 0048-0000-24-068-L01-P

Learning Objectives:

1. Explain the reasoning for needing a standardized thromboprophylaxis regimen.
2. Review the safety and efficacy of a prophylactic regimen utilizing enoxaparin based on weight adjusted dosing in reducing the incidence of significant bleeding and thrombus formation post operatively.
3. Identify the impact of standardized thromboprophylaxis protocols on patient outcomes, including length of hospital stay (LOS), in the context of laparoscopic sleeve gastrectomy.

Purpose:
A venous thromboembolism (VTE) is identified as the leading cause of post-operative mortality in gastric sleeve patients. Incidence of VTE after bariatric surgery ranges from 0.4-3.4%. There has been variability among bariatric surgeons in approach to thromboprophylaxis due to the lack of consensus regarding optimal prophylaxis in this population, all while weighing the risk of bleeding after bariatric surgery (4.94%). To date, no studies on thromboprophylaxis perioperative regimen in these patients exists. This study aims to evaluate the safety and efficacy of enoxaparin for thromboembolism prophylaxis in patients undergoing laparoscopic sleeve gastrectomy.

Methods:
A retrospective chart review of enoxaparin among patients who underwent laparoscopic sleeve gastrectomy. The prophylactic regimen allowed 30 mg of enoxaparin for patients weighing less than 300 lbs., 40 mg for patients between 300-400 lbs., and 60 mg for patients weighing greater than 400 lbs. Enoxaparin was initiated 2 hours prior to the procedure and then every 12 hours until discharge. The primary outcomes evaluated the incidence of a significant bleed or thrombus within 30 and 90 days of surgery. The secondary outcome observed the length of stay (LOS) after the operation.

Results:
1000 patients between July 2018- July 2023 were evaluated. Most patients were female, comprising 849 individuals, while the remaining 151 were male. Average age was 45.4 years old. Average BMI was 50.3 kg/m^2. A total of 2 (0.2%) patients had a major bleed requiring a transfusion, while 1 (0.1%) patient had VTE within the first 30 days post operatively. No events were reported at day 90. Average LOS was 35 hours. All three patients had an uneventful recovery after these events.

Conclusions:
The regimen utilized proved enoxaparin to be safe and efficacious in patients undergoing a laparoscopic sleeve gastrectomy and should be used to standardize VTE prophylaxis in this population.

Assessing outcomes related to Glucagon-like peptide 1 interclass switch in patients with diabetes

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Learning Objectives:

1. Review current guidelines and recommendations regarding the use of GLP-1 agonists in the treatment of type 2 diabetes and obesity.
2. Discuss outcomes related to treatment of diabetes and weight management when switching between GLP-1 agonist medications.

Purpose:
Glucagon-like peptide 1 agonists (GLP-1) are a first line treatment option for patients with type 2 diabetes (T2DM). GLP-1s have shown benefits in A1c lowering effects, ASCVD protection, and weight loss benefits. However, medications within this class have shown differing effects on these outcomes. The purpose of this study is to determine whether interclass GLP-1 switching due to a change in cash price and prior authorization requirements for insurance companies negatively impacts patients' health.

Methods:
This was a retrospective chart review of patients being treated with injectable semaglutide for treatment of type 2 diabetes or obesity and subsequently switched to another injectable GLP-1 medication from January 1, 2023 to December 31, 2023. The primary objective for this study was to assess the effect on A1c upon switching GLP-1s. The secondary objectives of this study was to evaluate the effect of both weight and adherence A1c upon switching GLP-1s.

Results:
A total of 26 patients were included in this study (11 patients being treated for diabetes and 15 patients being treated for weight loss). For the primary objective, no statistically significant changes in A1c were found. For the secondary objective, the average weight for patients with diabetes increased from 104.12 kg to 106.84 kg after the switch ($r = 0.927$, two-tailed p value = 0.097, one-tailed p value = 0.0489). For patients with diabetes, medication adherence decreased from 100% to 81.81% after the switch (two-tailed p value = 0.085, one-tailed p value = 0.0426). For patients being treated for weight loss, no statistically significant changes were found for weight or adherence.

Conclusions:
Overall, literature has supported the use of injectable semaglutide over other GLP-1RA medications for better weight loss and glycemic control. However, our study has shown that the only statistically significant outcome in switching from injectable semaglutide to another injectable GLP-1RA was a decrease in medication adherence for patients utilizing GLP-1RA for weight management. Further studies with larger sample sizes, consistent time frames for outcome measurements, data assessing lifestyle modifications, and consistent baseline diabetes medications will be needed to better assess outcomes from GLP-1 interclass switches.

Pharmacy Sustainability: Evaluation of Paper Processes within a Large Community Hospital

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Learning Objectives:

1. Describe strategies for health systems to implement sustainability.
2. Recognize methods for developing a culture of sustainability.

Purpose:

United States healthcare facilities produce a daily average of 14,000 tons of waste, which has encouraged healthcare systems to dedicate resources and form initiatives to support sustainability efforts. The Joint Commission proposed new requirements of hospitals to address some of these climate concerns, stating that hospitals need to take action to minimize their carbon footprints. The primary purpose of this study is to use identified areas of opportunity to implement operational changes, reduce paper product usage, and quantifying the waste reduction within the pharmacy department.

Methods:

This is a prospective pre- and post-quality improvement study at a 1,059-bed tertiary care community hospital that is assessing the use of paper within the central operations of the pharmacy department. Thes study was broken up into 2 phases. The first phase focused on data collection from staff on the primary uses of paper within the department which was then evaluated using a rubric created for the project. The second phase looked at three areas of opportunity identified from the rubric and performed a pre-post analysis on the changes in paper usage over a 3-month time span. Data collected included number of pages printed, number of labels printed, and number of IV narcotics dispensed.

Results:

We found that there was a reduction in the overall usage of paper products through the implementation of operational changes. We saw a reduction of 85 % in number of pages printed, an unknown percentage of reduction in labels printed, and a 33% reduction in number of pages used for narcotic dispenses.

Conclusion:

The overall project was successful in identifying opportunities for paper reduction and implementing operational changes to reduce waste. We concluded that many of the identified uses of paper had not been reviewed since implementation, and this implies that there are additional areas of opportunity for waste reduction, specifically with paper processes.

Assessing Opioid Prescribing Practices for Opioid-Naïve Surgical Patients

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UAN: 0048-0000-24-071-L08-P

Learning Objectives:

1. Discuss the background around the opioid epidemic and opioid prescribing at discharge
2. Review current literature about opioid prescribing at hospital discharge in opioid naïve patients
3. Evaluate current institutional guidelines regarding discharge opioids after surgical intervention

Purpose:

In response to the opioid epidemic, there have been increased efforts to address the overprescribing of opioids and acknowledgement of the need for an intervention, especially in post-surgical opioid naïve patients at time of discharge. Current literature has emphasized a concerning association between the number of refills and a heightened risk of misuse among opioid-naïve patients. Evaluating the current discharge opioid prescribing patterns in this patient population at Riverside Methodist Hospital (RMH) is vital for identifying opportunities to optimize practice and enhance patient safety.

Methods:

A retrospective chart review, evaluating opioid prescription practices and institutional guideline adherence in opioid-naïve surgical patients discharged from a not-for-profit community hospital. Data was collected from January through July 2023 by utilizing a pharmacy guided data report via the electronic medical record.

The primary aim of this study was to determine the frequency with which the institutional opioid prescribing guidelines were followed for post-surgical opioid-naïve patients. The secondary aim was determining patient-specific factors that can be associated with an increase or decrease in opioid prescriptions at the time of discharge.

Results:

Of the 14,178 patients screened for inclusion, 2000 underwent randomization for analysis. 1440 (72%) of the patients received a prescription for an opioid at discharge. 749 (37.5%) followed the opioid prescribing guidelines correctly. Significant factors that results in an increase in opioid prescribing were: age ≥60 ($p<0.001$); undergoing a level 2 procedure ($p=0.004$). Secondary outcomes assessed showed 989 (49.5%) patients received no additional or alternative pain medications (e.g. acetaminophen, ibuprofen, etc.) at discharge.

Conclusion:

In conclusion, the results showed a pattern of underutilization of the institutional prescribing guideline. The reason for underutilization could be evaluated by future research and education. The results displayed a pattern of prescribing more opioids than recommended by the guideline, most frequently occurring in older adults, as well as an underutilization of non-opioid pain control methods. These results reflected the previous research conducted on this topic, and support the need for clinical guidance surrounding post-operative opioid prescribing, and continued education on the use of the institutional guideline.

Evaluation of Optimal Dosing of Intravenous Methylprednisolone in Critically Ill Patients with Acute Exacerbations of Chronic Obstructive Pulmonary Disease

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Learning Objectives:

1. Discuss the role of glucocorticoid therapy for acute exacerbations of chronic obstructive pulmonary disease.
2. Describe how the use glucocorticoid therapy has been shown to differ from guideline recommendations among critically ill patients with acute exacerbations of chronic obstructive pulmonary disease.

Purpose:
The optimal dose of intravenous (IV) methylprednisolone for acute exacerbations of chronic obstructive pulmonary disease (COPD) in critically ill patients remains unclear. The aim of this study is to evaluate the effect of IV methylprednisolone dosing strategies on clinical outcomes in critically ill patients with COPD exacerbations.

Methods:
A single-center retrospective chart review was performed in patients who had a diagnosis of acute COPD exacerbation, were treated with IV methylprednisolone for greater than 48 hours, and who were admitted to a medical intensive care unit (ICU) or transferred to a medical ICU within 48 hours of hospital admission with an escalation of methylprednisolone dose. Patients were divided into two groups based on average weight based dose of methylprednisolone received within the first 48 hours of ICU admission (high dose > 1 mg/kg/day, low dose < 1 mg/kg/day). The primary outcome was ICU length of stay (LOS). Secondary outcomes included hospital LOS, duration of methylprednisolone therapy, duration of invasive mechanical ventilation, in-hospital mortality, incidence of hyperglycemia, and incidence of gastrointestinal (GI) bleed.

Results:
A total of 392 patients were screened for inclusion and 58 were included in the final analysis. There were 13 patients in the low dose group and 45 in the high dose group. Median ICU LOS did not significantly differ between the low and high dose groups (3.0 [1.8-6.5] days versus 2.8 [2.1-4.5] days, p=0.62). The median hospital LOS was numerically lower in the high dose group at 6.9 [4.4-11.9] days versus 8.9 [6.1-16.2] days (p=0.19). There were no significant differences in duration of methylprednisolone therapy, duration of invasive mechanical ventilation, in-hospital mortality, or adverse events.

Conclusion:
The use of high dose methylprednisolone resulted in similar ICU LOS and clinical outcomes when compared to low dose in critically ill patients with acute COPD exacerbations.

Effect of Perioperative Antibiotic Choice on Surgical Site Infections in Orthopedic Surgery

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UAN: 0048-0000-24-073-L01-P

Learning Objectives:

1. Review appropriate antibiotic prophylaxis for elective total/partial joint replacement and impact on prevention of post-operative infection.
2. Outline optimization strategy for pre-procedural processes to knee or hip arthroplasty to improve patient outcomes.

Purpose:
Based on concern for increasing bacterial resistance and inadequate coverage of alternative antibiotics recommended by 2013 ASHP surgery guidelines, this study aimed to review organism growth from surgical site infections in elective hip and knee arthroplasty at OhioHealth to see if antibiotic prophylaxis selection influenced patient outcomes.

Methods:
This retrospective patient case study reviewed 35 patients from January 1, 2019 to September 1, 2023 across OhioHealth system hospitals, including Doctors Hospital (DH), Mansfield Hospital (MH), and Marion General Hospital (MGH). Patients were included over 18 years and had a surgical site infection (SSI) within 90 days of either a total/partial knee or hip arthroplasty. Patients with multiple orthopedic procedures or receiving antibiotics for active infection at the time of surgery were excluded. Primary outcome was to describe patient and surgical site infection characteristics based on antibiotic choice. Secondary outcomes were to identify reasons for alternative antibiotic agents and determine number of patients who received alternative agents compared to first line recommendations.

Results:
Of 35 patients with SSI, 28 patients were included (9 patients from MH, 12 patients from DH, and 14 patients from MGH.) The orthopedic surgery breakdown was: 32% knee arthroplasty, and 68% hip arthroplasty. Of patients treated, 75% received cefazolin, 10% clindamycin, and 14% combination of antibiotics. While some patients grew multiple organisms, 92% of patients grew gram positive bacteria (21% with MRSA), and 10% gram-negative bacteria. Of patients, 35% never received MRSA probe/cultures

Conclusions:
Our patient case review found expected rates of gram-positive bacterial infections based on infection type. First line agent use for antibiotic prophylaxis was also better than expected with room for improvement on patients receiving multiple antibiotics instead of singular agent. Patient case review brought attention to optimization of our pre-procedural MRSA testing

Investigating the cardio-oncology patient population at a large, multi-site health system: a descriptive analysis

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UAN: 0048-0000-24-074-L01-P

Learning Objectives:

1. Review cancer therapy-related cardiac dysfunction, including current guideline recommendations for patient management.
2. Evaluate recent primary and secondary literature that may impact clinical practice and future guideline recommendations in patients with cancer therapy related cardiac dysfunction.
3. Analyze the results of a multi-site, retrospective chart review to determine areas for improvement in the patient care process for the cardio-oncology patient population.

Purpose:
This study aims to characterize the cardio-oncology patient population and evaluate the incidence of cardiovascular toxicities, the frequency of cardiac monitoring, and the management of cardiac dysfunction related to cancer treatment.

Methods:
This is a retrospective, descriptive study conducted at a large, multi-site health system between June 1, 2020, and May 31, 2022. We reviewed the electronic health records of patients with cancer who received cardiotoxic anti-cancer (doxorubicin, trastuzumab, and pertuzumab) during the study period. Data collection included patient demographics, cancer diagnosis and treatment, risk factors for heart failure, new consultations, echocardiogram results, prescribed heart failure guideline directed medical therapy, and hospitalizations due to heart failure. Descriptive statistics were used to analyze and report the data.

Results:
During the study, 685 patient charts were reviewed and 185 were included based on patients' receiving their first dose of cardio-toxic, anti-cancer therapy following diagnosis. After anti-cancer therapy started, 21.3% of patients developed CTRCD based on left ventricular ejection fraction (LVEF) change of greater than 10% decrease from baseline or a decrease below 50%. At baseline, the cohort who developed CTRCD had more beta blockers prescribed (31% vs. 13%) and on average had more cardiovascular risk factors (1.06 vs 0.89, p=0.150) than the cohort who did not develop CTRCD. After therapy was initiated, patients who developed CTRCD had more consultations placed to the heart failure service (11.54% vs 2.08%, p=0.031) while the patients who did not develop CTRCD had more consultations placed to the cardio-oncology service (14% vs. 86%). Patients with CTRCD had more hospitalizations (15.38% vs 3.13%, p=0.016) as well.

Conclusions:
Overall, patients who developed CTRCD had more hospitalizations and changes to their cardiac medications than patients who did not develop CTRCD. Integration of a process to streamline the care of cardio-oncology patients including recommendations for preventative care, regular LVEF assessment, and when to refer the patient to cardio-oncology services will help providers better serve this patient population and ensuring they receive optimal care.

Antiemetic prescribing in patients receiving highly emetogenic chemotherapy

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Learning Objectives:

1. Discuss the pathophysiology and types of chemotherapy induced nausea and vomiting
2. Evaluate guideline recommended antiemetic regimens appropriate for highly emetogenic chemotherapy

Purpose:
Antiemetic therapies are an important part of treating cancer patients requiring highly emetogenic chemotherapy (HEC). The National Comprehensive Cancer Network recommends a four-drug antiemetic regimen first-line with several second-line regimens also supported for HEC. The intent of this study is to evaluate institutional adherence to guideline recommended antiemetic prescribing in patients receiving HEC at a community hospital infusion center.

Methods:
This project was approved as a quality improvement determination by the OhioHealth Office of Human Subjects Protections. The study was a retrospective, single-center case series assessment of patients with HEC regimens receiving antiemetics in 2022. The primary outcome was the rate of adherence to any of the three guideline supported HEC antiemetic regimens, assessed in aggregate across the first day of up to 6 HEC cycles. Secondary outcomes evaluated nonadherent regimens for medication exclusion and suboptimal dosing. Outcomes were assessed descriptively.

Results:
The population of 258 patients were assessed as receiving 1-6 cycles of a HEC regimen in 2022. Patients received a guideline supported antiemetic regimen at a 76.7% rate (198 vs 60 patients). The 60 patients that received nonadherent regimens primarily received a two-drug regimen (70%). Dose appropriateness was found to be suboptimal primarily in the steroid drug class (26%). Reasons for nonadherent antiemetic prescribing were not well documented.

Conclusions:
Local opportunities exist to improve adherence to guideline-supported antiemetic regimens in patients receiving HEC. Prescriber education, target pharmacist interventions, and electronic medical record optimizations are being recommended.

Impact of a Pharmacist-Led Employee Wellness Hypertension Program Utilizing Remote Monitoring Devices

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Learning Objectives:

1. Describe the prevalence of hypertension and the cost of its complications
2. Identify benefits of remote patient monitoring (RPM)
3. Explain the impact of a pharmacist-led employee blood pressure remote monitoring program

Purpose:

Employers have developed various wellness programs for their employees in an attempt to decrease healthcare and productivity costs. Hypertension is one of the top 10 most expensive medical conditions for employers and affects nearly 50% of adults in the United States. The integration of remote patient monitoring into telehealth provides clinicians with more comprehensive data to be used for remote clinical decision making and addresses challenges such as transportation barriers, time away from work, and access to care. Previous studies have shown the positive impact that remote monitoring of blood pressure and follow-up with a pharmacist has on patients' blood pressure control. However, to our knowledge, there are no studies describing a pharmacist-led remote blood pressure monitoring program as part of an employee wellness program. The goal of this study is to assess the impact of pharmacist involvement in an employee wellness hypertension program utilizing remote blood pressure monitoring.

Methods:

Employees and health insurance beneficiaries with a diagnosis of hypertension or a documented high blood pressure reading at a previous screening encounter will be enrolled into the program. Once the patient's primary care provider approves participation, the patient will be provided with a remote blood pressure monitoring device. At the first appointment, baseline blood pressure will be obtained, blood pressure goals will be established, and education will be provided on the use of the device. A pharmacist will follow up with the patients either in person or via telehealth throughout the program, with in-person visits at months 3 and 6. Recommendations regarding changes to the medication therapy will be made to the patient's provider. The primary outcome is the change in systolic and diastolic blood pressure (mmHg) from baseline to months 3 and 6. Secondary outcomes include the percentage of patients who meet their blood pressure goal at months 3 and 6, the percentage of the pharmacist's recommendations accepted by the patient's provider, the percentage of patients with adherence to follow-up visits and the use of the device, and patient satisfaction with the care provided through the program. The primary outcome will be assessed using a paired t-test and secondary outcomes will be assessed using descriptive statistics. Patient satisfaction with the program will be assessed with a survey.

Results:

As of March 2024, 24 patients have enrolled in the program. The mean baseline systolic and diastolic blood pressure was 134 mmHg and 85 mmHg, respectively. At baseline, 33% of patients did not have a diagnosis of hypertension, and 63% of patients with a prior diagnosis of hypertension had a blood pressure above their goal. Additional data will be presented at the Ohio Pharmacy Resident Conference.

Conclusions:

Preliminary data indicates significant patient interest and a clear need for an employee wellness program focusing on blood pressure management. Pharmacists have considerable opportunity to positively impact employee blood pressure control throughout the program.

Implementation of a Pharmacist-Led Employer-Based Weight Management Program in a Rural, Ambulatory Care Setting

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Learning Objectives:

1. Evaluate and summarize the existing evidence supporting the efficacy of GLP-1 RAs in weight loss and other disease states other than diabetes mellitus.
2. Analyze the challenges and barriers associated with insurance coverage for GLP-1 RAs including formulary restrictions, prior authorization requirements, and reimbursement limitations.
3. Assess the benefits of pharmacist-led lifestyle interventions in promoting health outcomes, with a focus on weight management.

Purpose:

The approval of semaglutide and tirzepatide for weight loss has reshaped the management of obesity. These new glucagon-like peptide-1 receptor agonists (GLP-1 RA) can provide a 10-20% decrease in body weight. Insurance coverage of these medications have been a barrier, as only 10-16% of health plans cover any weight loss medications. Pharmacists can help patients navigate management and barriers of GLP-1 RAs for weight loss. The goal of this study is to create an employee-based weight loss management program to show the benefits pharmacists can provide in regard to obesity and overall wellness.

Methods:

Study participants were recruited via email about the launch of the new employee program. All employees and beneficiaries of Ohio Northern University insurance are eligible to enroll. Participants must have a BMI > 30 kg/m^2 or BMI > 27 kg/m^2 with one weight-associated comorbidity. The primary endpoint of this study is the mean change in weight from baseline. Exploratory secondary endpoints include mean change in diastolic and systolic blood pressure from baseline, mean change in LDL and HDL cholesterol from baseline, mean change in hemoglobin A1c from baseline, and proportion of participants who achieve a 5% weight loss over six months. The program will be customizable to meet each participant's health goals. Lifestyle behaviors will be the focus for most participants. For those that are interested in anti-obesity medications, the pharmacist will discuss options available and help navigate any cost barriers. Participants will have the option to attend monthly group sessions that may include health-related seminars, fitness classes or small group dietician classes. The pharmacist will follow up with a phone call at least every month to provide motivation and accountability. More frequent phone calls or email follow ups will be available for participants that require a more consistent check-in. Participants will complete a 3-month visit and 6-month visit to collect labs and vitals.

Results:

Enrollment started late March 2024. Baseline characteristics and additional data will be presented at the Ohio Pharmacy Residency Conference.

Conclusions:

Conclusions will be presented at the Ohio Pharmacy Residency Conference.

Apixaban vs. Warfarin for Treatment of Venous Thromboembolism in Patients With Severe Renal Impairment: A Multicenter Study

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UAN: 0048-0000-24-078-L01-P

Learning Objectives:

1. Recognize the impact of renal impairment on the pharmacokinetics and dosing considerations in anticoagulation therapy.
2. Evaluate the existing evidence regarding the safety and efficacy of apixaban in the treatment of venous thromboembolism (VTE) in patients with severe renal impairment.

Purpose:

To examine the safety and effectiveness of apixaban versus warfarin for the treatment of VTE in patients with severe renal impairment.

Methods:

This is a multicenter, retrospective cohort study conducted across 36 Ascension Health hospitals. Adult patients receiving apixaban or warfarin for the treatment of VTE with severe renal impairment (chronic kidney disease (CKD) stage IIIB, IV, V, or receipt of renal replacement therapy) were included. Patients were excluded if bleeding at hospital admission, therapeutic anticoagulation prior to admission, continuous renal replacement therapy, coagulopathy, severe liver disease, or receipt of contraindicated medications. The primary outcome was time to composite bleeding event (major bleed (MB) + clinically relevant non-major bleed (CRNMB)) within six months of anticoagulation initiation. Bleeding was defined using definitions from International Society on Thrombosis and Haemostasis.

Results:

A total of 939 apixaban and 336 warfarin patients were included in the preliminary analysis. No difference in time to composite bleeding (p=0.577) or incidence of composite bleeding (11.2% vs 12.5%) was noted between apixaban and warfarin. Furthermore, individual components of the primary endpoint were similar between groups, MB (8.5% vs 8.6%, p=0.962), CRNMB (4.4% vs 6.2%, p=0.175). When stratified by CKD stage (IIIb: 8.1%; IV: 53.5%; ESRD: 38.5%), no significant interaction was observed on composite bleeding (p=0.081). Anticoagulation related readmission rates (7.6% vs 9.6%, p=0.264), recurrent VTE (3.5% vs 4.2%, p=0.587) and all-cause mortality (5.0% vs 7.2%, p=0.123) were similar between groups.

Conclusions:

Based on our preliminary analysis, there was no difference in time to composite bleeding in patients with severe renal impairment receiving apixaban versus warfarin for VTE treatment.

Development of a Nicotine Cessation Clinic Within a Community Hospital in Rural Ohio

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Learning Objectives:

1. Discuss community needs for a nicotine cessation program.
2. Identify how to implement a nicotine cessation clinic within our facility.
3. Describe the benefit of pharmacist involvement in the monitoring and the management of the nicotine cessation clinic.

Purpose:

Tobacco use can lead to several health complications such as cancer, heart disease, chronic obstructive pulmonary disease and can slow healing processes. According to the Ohio Department of Health, data from 2020 shows that around 1 in 5 adults are smoking cigarettes and 3 in 50 adults use e-cigarettes. The data shows over half of adult cigarette smokers in Ohio had made at least one attempt to stop smoking from 2019 to 2020. The development of a nicotine cessation clinic allowing for referrals from inpatient and outpatient providers could greatly impact the overall health of our community.

Methods:

A prospective chart review will be completed to identify patients who are current nicotine users who have received care from different departments owned by the hospital. During patient visits, the provider will be given an option to send a referral to the disease management team for the patient to enroll in the program. Pharmacists will conduct the meetings to discuss goals, education, and treatment options. The initial appointment will take place and a quit date will be set. Follow up appointments will happen at one month from the initial visit, then 2 months later, then three months later, etc. If there is a relapse, the timeline will start over again. The primary objective is to implement a nicotine cessation clinic to potentially decrease health complications within the community due to tobacco and nicotine use. Primary outcomes will include the number of referrals from providers and the number helped by the program. Secondary outcomes are evaluating barriers to implementing treatment and assessing relapse rate after 6 months.

Results:

The results of this study are pending. Data will be available once the clinic is established and fully functioning. Preliminary results will be presented at OPRC.

Conclusions:

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

Post-Procedure Antithrombotic Strategies After Left Atrial Appendage Occlusion in Patients with Atrial Fibrillation

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UAN: 0048-0000-24-080-L01-P

Learning Objectives:

1. Review the recommended post-implantation drug regimen options and duration.
2. Identity the most common complication after LAAO device implantation.

Purpose:

Atrial fibrillation (Afib) is the most common cardiac arrhythmia which is associated with a five-fold increased risk of stroke. Current guidelines recommended patients with a CHA2DS2-VASC score of $\geq$ 2 in men and $\geq$ 3 in women should receive anticoagulation to reduce stroke risk. The left atrial appendage occlusive (LAAO) device, such as the Watchman, Watchman FLX, and Amulet are approved to reduce the stroke risk in patients who are unable or at high risk to be on oral anticoagulation. This study seeks to evaluate the outcomes of patients who underwent LAAO device implantation at Corewell Health-Dearborn Hospital.

Methods:

This study was an IRB-approved single center, retrospective cohort analysis for patients 18 years and older who received LAAO device implantation between January 1, 2019 to July 31, 2023. Patients who met eligibility criteria were separated by the post-implantation anticoagulation or antiplatelet therapy that was initiated. These arms included warfarin monotherapy, warfarin and aspirin, DOAC monotherapy, DOAC and aspirin, DAPT (P2Y12 inhibitor and aspirin). The primary endpoint was any adverse event and readmission at 45 days. Secondary outcomes included any adverse event and readmission through the follow up visits at 6 and 12 months. Any adverse event included any TIA, stroke, intracranial bleed, major bleed requiring hospitalization, systemic embolism, device embolism, myocardial infarction, cardiac arrest, or death.

Results:

Results and conclusions will be presented at the 2024 Ohio Pharmacy Residency Conference.

Conclusions:

Results and conclusions will be presented at the 2024 Ohio Pharmacy Residency Conference.

Prioritizing patient values regarding pharmacy culture in a LGBTQ+-focused pharmacy

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Learning Objectives:

1. Discuss barriers that LGBTQ+ people face when accessing healthcare and pharmacy services.
2. Describe what general and inclusive pharmacy services are offered in an LGBTQ+-focused pharmacy.
3. Identify top priority pharmacy culture initiatives to improve inclusivity in a community pharmacy.

Purpose:

A research study has been previously completed at these LGBTQ+-focused community pharmacies, which showed the need to further understand patient priorities when it comes to pharmacy culture. The primary objective of this research project is to identify and prioritize pharmacy culture patients value at a LGBTQ+-focused community pharmacy. The secondary objective is to determine if there are differences in patient priorities based on self-reported patient identities.

Methods:

This cross-sectional study surveyed patients in four LGBTQ+ community-based health-system pharmacies across Ohio. Participants were at least 18 years of age and self-reported their gender and sex assigned at birth. Participation was voluntary and anonymous. The survey was disseminated in person at the point of sale through the platform REDCap. Participants were asked to assess the importance of 17 services offered by these pharmacies through a Likert scale question format. Participants were then asked to choose the top 3 most important general services common across community pharmacies and the top 3 most important services related to inclusivity efforts at Equitas Health pharmacies. Responses were collected over a 30-day period.

Results:

Three hundred and one surveys were collected over a period of 30 days (February 13th – March 14th). Data analysis is ongoing, and results will be presented at the 2024 Ohio Pharmacy Resident Conference.

Conclusions:

Discussion of results will be presented at the 2024 Ohio Pharmacy Resident Conference.

Stratifying Risk for Hypersensitivity Reactions in Patients Receiving Paclitaxel Infusions

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Learning Objectives:

1. Define paclitaxel associated hypersensitivity reactions.
2. Identify potential risk factors for hypersensitivity reactions in patients receiving paclitaxel.

Purpose:
Paclitaxel is a widely used chemotherapeutic agent used in numerous cancer types. One of its adverse effects, hypersensitivity reactions, are a major complication of therapy and can have life-threatening consequences. However, the mechanism of these reactions is unclear. The purpose of this study is to identify potential risk factors for the reaction which may aid in mitigating reactions in the future.

Methods:
This is a multicenter, case-control study conducted at three Corewell Health East Hospitals from July 1st, 2021 – June 30th, 2022. Patients 18 years and older who received paclitaxel at either the Dearborn, Royal Oak, or Troy infusion centers were included. Patients who were pregnant or experienced a non-hypersensitivity related adverse reaction were excluded. The primary outcome was to determine which risk factors were independently associated with a higher rate of paclitaxel hypersensitivity reactions. Secondary outcomes were to determine whether manufacturer, higher drug concentrations, type of line access, history of Covid, history of Covid vaccine, aprepitant therapy, platinum therapy or immunotherapy were associated with higher rates of reactions.

Results:
A total of 305 patients were included in this study (54 cases and 251 controls). The mean age was 59.6 ± 10.7 for cases and 65.0 ± 10.7 for controls. The mean body surface area was 1.97 ± 0.30 for cases and 1.89 ± 0.27 for controls. Paclitaxel administration via peripheral line, drug concentration of 0.8 – 1.2mg/ml, and 3-hour infusion time were statistically significant and identified as individual risk factors for potential higher risk of hypersensitivity reaction. There were no significant findings for manufacturer, Covid history, or Covid vaccine history. Concurrent aprepitant therapy, platinum therapy, or immunotherapy were not associated with increased risk of hypersensitivity reactions.

Conclusions:
This study suggests that peripheral line access, higher drug concentration, and 3-hour infusion time are potential risk factors for paclitaxel hypersensitivity reactions.

Assessing the Effectiveness of Pharmacist Guidance for Heparin Infusion Management in Response to a Sustained hPTT Elevation at a Community Hospital

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UAN: 0048-0000-24-083-L01-P

Learning Objectives:

1. Review the internal guidance utilized by pharmacists at an institution with a nurse-driven heparin titration protocol for when responding to a sustained hPTT elevation and the potential safety concerns if not managed appropriately.
2. Identify ways that pharmacy can make interventions to improve safety and patient outcomes based on primary literature.

Purpose:
The management of intravenous heparin infusions are dependent on institution-specific nomograms due to laboratory variations. There is a lack of formalized guidance with clear recommendations on how heparin infusions should be titrated when there is a sustained elevation (reported as >200 seconds) in heparin partial thromboplastin time (hPTT). An institution-specific internal guidance document was developed for pharmacists to provide specific, consistent recommendations for heparin infusion rate adjustments following a sustained hPTT elevation.

Method:
A single-site retrospective chart review was completed to evaluate pre- and post- implementation of a pharmacist guidance document addressing sustained hPTT elevations. To be included, a patient must be on a heparin infusion and found to have two consecutive elevated hPTTs. Patients were subsequently excluded if a timely hPTT was not checked following heparin resumption or if heparin was discontinued within 24 hours. Patients in the pre-group were excluded if there was clear pharmacist intervention documented and patients in the post-group were excluded if there was no pharmacist intervention. The primary outcome is the percentage of therapeutic initial post-resumption hPTT in the pre-group vs. post-group. To achieve 80% power, each group would require 38 patients. Safety was evaluated using the Bleeding Academic Research Consortium (BARC) criteria.

Results:
A total of 36 patients were included, 22 in the pre-group and 14 in the post-group. The primary outcome of therapeutic initial post-resumption hPTT was not significant between pre-group and post-group, respectively (86% vs. 93%, p = 0.106). The pre-group had three incidences of bleeding (BARC types 1, 2, and 3a) and the post-group showed two incidences of bleeding (both BARC type 2).

Conclusion:
The internal pharmacist guidance showed a non-significant change in the initial post-resumption therapeutic hPTT; further investigation is necessary.

Evaluation of Current Credentialing and Privileging Criteria for Inpatient Pharmacists

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Learning Objectives:

1. Define credentialing and privileging as it relates to healthcare organizations.
2. Recognize the elements of implementing a standard credentialing and privileging process for pharmacists.

Purpose:

The purpose of this project was to develop a standardized credentialing and privileging process for inpatient pharmacists that is applicable across a multicenter health system and trial the process components at a single institution within the health-system.

Methods:

A review of current literature was completed. A policy was drafted based on the minimum qualifications for an inpatient pharmacy staffing position and used health-system wide clinical guidance documents to outline the topics of the accompanying competencies. Two competencies were created: one for initial new hires, and one annual competency. Each of our department pharmacists were asked to complete a pre-competency survey that recorded his or her self-perceived confidence and satisfaction with his or her understanding of the current policies and location of resources. Each pharmacist was then asked to complete either the initial credentialing competency or the annual privileging competency with a goal of passing with an 85% or higher. Then, the pharmacists were given a competency checklist and a 1-month period to try and complete the checklist as fully as their daily responsibilities allowed them before taking the alternate competency exam and completing the secondary post-competency survey. The results of the surveys were analyzed for trends in feedback and perceived performance of the pharmacists.

Results:

N= 32 inpatient pharmacists participated in the preliminary survey. The average score on the initial competency (N = 20) was 95% and 94% (N= 16) on the annual competency with only 2 people not passing each with ≥85%. The majority (79%) of pharmacists felt that the competencies refreshed their clinical skills and 64% learned how to use a new resource or tool. Pharmacists felt that completing a competency every 2 years was reasonable, and 71% reported that they would like to do a competency like this one again.

Conclusions:

Final conclusions to be presented.

Effects of tirzepatide on HbA1c and body weight after switching from semaglutide or dulaglutide

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Learning Objectives:

1. Review the updated ADA guidelines for the treatment of type 2 diabetes mellitus.
2. Describe the differences in HbA1c levels for patients switched to tirzepatide from other GLP-1 receptor agonists.

Purpose:

Despite the many medications available for the treatment of type 2 diabetes mellitus (T2DM), many patients still struggle to control their diabetes. Tirzepatide (Mounjaro) is a novel dual glucose-dependent insulinotropic polypeptide (GIP) and glucagon-like peptide-1 (GLP-1) receptor agonist. Tirzepatide's GIP receptor agonism, in addition to its GLP-1 receptor agonistic effects, have been shown to improve weight loss and HbA1c reduction in patients with T2DM. The purpose of this study is to assess the effects of tirzepatide on HbA1c and body weight after patients with T2DM have been switched to tirzepatide from semaglutide or dulaglutide.

Methods:

This is a single-center, retrospective chart review evaluating HbA1c 6 months before and at least 3 months after initiating tirzepatide therapy in patients who were previously taking semaglutide or dulaglutide. Patients included will be ≥18 years of age with T2DM being managed by the Aultman Alliance Community Hospital's MEDS Clinic for at least 6 months who are currently having their tirzepatide therapy managed by the MEDS Clinic. Patients with type 1 diabetes, a personal or family history of medullary thyroid carcinoma, multiple endocrine neoplasia syndrome type 2, and/or a history of pancreatitis will be excluded. Data will be collected via retrospective chart review between 3/1/2022 and 04/01/2024. The secondary outcome will assess changes in body weight before and after switching to tirzepatide.

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.

Comparison of Potassium Lowering with 5 Units versus 10 Units of Intravenous Insulin for the Treatment of Severe Hyperkalemia

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Learning Objectives:

1. Evaluate the existing literature regarding use of insulin for the treatment of hyperkalemia.
2. Discuss the impact of insulin dose on potassium lowering in patients with severe hyperkalemia.

Purpose:
Treatment for patients with hyperkalemia traditionally includes 10 units of intravenous (IV) insulin as a first-line option. However, recent literature has shown that 5 units is associated with less hypoglycemia than 10 units and may be safer in certain patient populations. These studies report conflicting data regarding the efficacy of a lower IV insulin dose. Evidence is unclear as to what dose of IV insulin is appropriate for patients with higher degrees of hyperkalemia. This study compared the potassium lowering ability of 5 units versus 10 units in the setting of severe hyperkalemia (K > 6.0 mMol/L).

Methods:
This is an IRB-approved, single-center, retrospective cohort study that evaluated patients with severe hyperkalemia treated with IV insulin between February 2022 and December 2023. Patients ≥ 18 years with a potassium level of 6.0 mMol/L or greater were included. Patients were excluded if they received doses of IV insulin other than 5 or 10 units, did not have a repeat potassium level checked within 6 hours of IV insulin administration, or if they received dialysis prior to their first potassium re-check. Patients were divided into two groups based on the insulin dose received: 5 units or 10 units. Additional data points included age, gender, weight, blood glucose, renal function, diabetes status, specific home medications that affect potassium-lowering or blood glucose, dextrose dose, time to potassium re-check, and concomitant or repeat hyperkalemia treatment. The primary outcome assessed mean potassium reduction within 6 hours of treatment with IV insulin. Secondary outcomes included hypoglycemia (blood glucose <70 mg/dL), severe hypoglycemia (blood glucose <50 mg/dL), arrythmia following treatment with IV insulin related to hyperkalemia, and cardiac arrest following treatment with IV insulin related to hyperkalemia. Continuous outcomes were analyzed with a Student T-test and nominal data was analyzed using a Chi-squared or Fisher's Exact test, as appropriate.

Results:
Of the 580 insulin orders screened, 188 met inclusion criteria for this study (94 in each group). Average potassium level prior to treatment was similar between groups, 6.53 mMol/L and 6.57 mMol/L in the 5 and 10 unit groups respectively (p=0.61). The primary outcome of mean potassium lowering was also similar between groups, 1.08 mMol/L and 1.25 mMol/L in the 5 and 10 unit groups respectively (p= 0.09). There was no difference between groups for all secondary endpoints.

Conclusions:
This study did not find a statistically significant difference in potassium reduction between 5 units and 10 units of IV insulin for the treatment of severe hyperkalemia.

Efficacy of Inpatient Sodium-Glucose Cotransporter 2 Inhibitor Initiation in Heart Failure

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UAN: 0048-0000-24-087-L01-P

Learning Objectives:

1. Review current literature and guideline recommendations for SGLT2 inhibitors (SGLT2i) in chronic heart failure management
2. Discuss the role of initiating SGLT2i for heart failure during a hospital admission

Purpose:

SGLT2i are shown to reduce mortality and hospitalizations in patients with heart failure. Recent literature suggests initiating an SGLT2i for patients with heart failure during hospitalization may reduce heart-failure-related rehospitalizations. As a result, the Detroit Medical Center (DMC) added empagliflozin to its inpatient formulary.

Methods:

This was a retrospective chart review of patients who received empagliflozin while hospitalized at a DMC hospital from September 1, 2022, to July 31, 2023. This study aims to determine the incidence of 90-day heart-failure-related rehospitalization in patients started on empagliflozin during an inpatient hospitalization at the DMC. Secondary outcomes for this study include the 90-day heart-failure-related rehospitalization rate of patients who received an SGLT2i prescription after hospital admission from September 1, 2021, to July 31, 2022, 90-day total heart-failure-related rehospitalizations, and 90-day rehospitalizations due to an empagliflozin-related adverse event. The hospitals included in this study are the Harper-Hutzel Hospital, Detroit Receiving Hospital, Sinai Grace Hospital, and Huron Valley-Sinai Hospital.

Results:

Since the addition of empagliflozin to the DMC formulary, 32 of 195 (16.4%) patients who have initiated empagliflozin for heart failure during their hospitalization experienced a 90-day heart failure-related rehospitalization after discharge. The average day of rehospitalization was 39.28 days, and no patients experienced a 90-day rehospitalization for empagliflozin-related adverse effects. In the previous year, 8 of 32 (25.0%) patients who were prescribed either empagliflozin or dapagliflozin at discharge experienced a 90-day heart failure-related hospitalization.

Conclusions:

After the addition of empagliflozin to the DMC formulary, the incidence of 90-day heart failure-related rehospitalization after inpatient empagliflozin initiation for heart failure was 16.41%, which is a decreased rehospitalization rate compared to the 25% of patients discharged with an SGLT2i prescription the previous year.

Impact of Change in Regulations on Buprenorphine Prescribing

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UAN: 0048-0000-24-088-L08-P

Learning Objectives:

1. Review current evidence-based management of Opioid Use Disorder (OUD)
2. Discuss the impact of regulation changes on buprenorphine prescribing habits at a community teaching hospital

Purpose:

Opioid use disorder (OUD) affects over 2.3 million people in the United States, however only 20 - 40% of people with OUD receive evidence-based treatment. One of the many barriers to OUD treatment has been burdensome regulatory procedures. In December 2022, federal regulations changed to increase access to buprenorphine for patients who need OUD treatment. The requirement for prescribers to obtain a DATA or X waiver was removed, and, currently, buprenorphine only requires a standard DEA registered license to be prescribed. The purpose of this study is to evaluate the impact of change in regulations on buprenorphine prescribing at a community teaching hospital.

Methods:

This single-center, retrospective cohort study investigates buprenorphine prescribing habits for adult patients with OUD before and after changes in federal regulations. The before group includes patients who presented to Trinity Health Oakland from March to December 2022, and the after group includes patients who presented March to December 2023. Patients are included if they are at least 18 years old, have documented OUD, and have either an ICD-10 diagnosis for OUD or buprenorphine ordered for OUD. Patients are excluded if they receive other evidence-based medication-assisted treatment for OUD, including methadone or naltrexone; have a history of OUD that no longer requires treatment; were receiving buprenorphine with or without naloxone for indications other than OUD; or have no documented indication for buprenorphine. The primary outcome is the percentage of patients with OUD who received buprenorphine with or without naloxone before and after the changes in regulations. Secondary outcomes include reported adverse events to buprenorphine, percentage of patients who received discharge prescriptions for buprenorphine, and patient disposition or discharge location.

Results:

Results will be presented at the 2024 Ohio Pharmacy Residency Conference.

Conclusions:

Conclusions will be presented at the 2024 Ohio Pharmacy Residency Conference.

Comparison of adverse events associated with dapagliflozin vs. empagliflozin

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UAN: 0048-0000-24-089-L01-P

Learning Objectives:

1. Review current guidelines and literature for goal directed medication therapy for heart failure patients.
2. Discuss the side effects associated with sodium-glucose cotransporter-2 inhibitors (SGLT2i).

Purpose:
Sodium-glucose cotransporter-2 inhibitors (SGLT2i) have been proven to decrease the risk of cardiovascular events, hospitalizations, and death in patients with heart failure. Historically, health systems have been hesitant to initiate SGLT2i therapy for inpatients, citing concerns about safety issues and potential adverse events. Recently, evidence has emerged supporting inpatient SGLT2i initiation in heart failure patients. The purpose of this study was to compare the incidence of adverse events following inpatient initiation of dapagliflozin or empagliflozin.

Methods:
This was an institutional review board approved, single center, retrospective cohort study of adult patients with heart failure with reduced ejection fraction admitted to our institution between January 1, 2023 and June 31, 2023 newly initiated on dapagliflozin or empagliflozin for treatment of heart failure. Adverse events within 30 and 90 days of dapagliflozin vs. empagliflozin initiation were evaluated, including hemodynamic, infectious, and renal events.

Results:
Of 498 patients screened, a total of 83 patients were included in this study (24 dapagliflozin group, 59 empagliflozin group) with a mean age of 62 years (SD ± 18.5) and 51 patients (61.4%) being male. By 30 days, a total of 5 patients in the dapagliflozin group and 8 patients in the empagliflozin group experienced and adverse event (20.8% vs. 13.6%; p=0.408). By 90 days, a total of 7 patients in the dapagliflozin group experienced an adverse event compared to 15 patients in the empagliflozin group (29.2% vs. 25.4%; p=0.726). The only statistically significant adverse event was incidence of volume depletion at 30 days (12.5% dapagliflozin vs. 1.7% empagliflozin; p=0.037).

Conclusions:
Overall, no difference in adverse events between the two groups was observed with the exception of volume depletion at 30 days. Larger randomized head-to-head trials of dapagliflozin versus empagliflozin are needed to accurately assess the incidence of adverse events.

Evaluation of Weight-Based Dosing of Intravenous Diltiazem in Obese Patients with Atrial Fibrillation with Rapid Ventricular Response

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UAN: 0048-0000-24-090-L01-P

Learning Objectives:

1. Outline current guidelines for the management of Afib with RVR.
2. Identify an appropriate diltiazem dosing strategy for patients in Afib with RVR with a BMI ≥30.

Purpose:
Intravenous (IV) diltiazem is considered a first line agent for rate control in patients who are in atrial fibrillation (Afib) with rapid ventricular response (RVR). Though previous literature suggests a low dose IV bolus of diltiazem may be as effective as standard dosing, obese patients have been underrepresented. As such, there is insufficient data to suggest an appropriate weight-based dose of IV diltiazem in the obese population. This retrospective review sought to identify differences in achieving therapeutic response in obese patients (BMI ≥30) receiving standard versus low dose diltiazem.

Methods:
This was a single-center, retrospective, IRB-approved study that sought to evaluate obese patients presenting to the emergency department (ED) in Afib with RVR who received a bolus of IV diltiazem between January 2021 and August 2023. Inclusion criteria consisted of patients ≥ 18 years old with a BMI ≥30 found to be in Afib with RVR (heart rate ≥ 100 beats per minute) and who received an IV bolus of diltiazem in the ED during the study timeframe. Patients were excluded if they were pregnant at the time of presentation, did not have documented heart rates before and after administration of an IV diltiazem bolus, or had no recorded weight in the electronic medical record. Patients were divided into two groups based on the initial weight-based bolus dose of IV diltiazem administered: low dose (<0.2 mg/kg) and standard dose (≥0.2 mg/kg). The primary outcome was achievement of a therapeutic response within 30 minutes of initial IV bolus of diltiazem. Therapeutic response was defined as achieving a heart rate of ≤ 100 beats per minute and/or achieving a ≥20% reduction in heart rate. Secondary outcomes assessed incidence of hypotension, bradycardia, maximum change in heart rate, and need for escalation of rate control therapy. Data was analyzed utilizing independent t-tests, chi-squared tests, or Fishers exact tests where appropriate.

Results:
A total of 218 participants were included in this study, 35 participants in the standard dose group and 183 participants in the low dose group. There was no significant difference between the groups in achievement of a therapeutic response within 30 minutes of initial IV bolus of diltiazem (p=0.508). There was no difference in the observed rates of hypotension (p=0.1405), bradycardia (p=1.00), or maximum change in heart rate (p=0.5389) between the groups. There was also no difference in number of patients who required escalation of rate control therapy.

Conclusions:
In patients with a BMI ≥30 who presented to the ED in Afib with RVR, there was no difference in achievement of therapeutic response when treated with low or standard dose diltiazem.

Impact of Timing of Four-Factor Prothrombin Complex Concentrate (4F-PCC) Administration on Outcomes in Oral Factor Xa Inhibitor-associated Intracranial Hemorrhage

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Learning Objectives:

1. Describe current evidence of 4F-PCC use in oral factor Xa inhibitor-associated intracranial hemorrhage
2. Evaluate the relationship of time and hematoma expansion in oral factor Xa inhibitor-associated intracranial hemorrhage

Purpose:

The incidence of intracranial hemorrhage (ICH) in patients on oral factor Xa inhibitors has been estimated to be 0.5-1% annually with a 50% mortality rate at 30-days. Since FDA approval, these agents are considered to be first-line therapies over vitamin K antagonists (VKA) for indications such as; stroke prevention in patients with non-valvular atrial fibrillation and treatment of venous thromboembolism. In ICH patients receiving VKAs, time to treatment with 4F-PCC has been shown to have an impact on patient outcomes. However, the optimal timing of 4F-PCC has not been determined in patients with ICH on oral factor Xa inhibitors. The purpose of this study is to determine the impact of time-to-treatment on outcomes in patients receiving 4F-PCC in oral factor Xa inhibitor-related ICH.

Methods:

This study will be a retrospective chart-review of patients admitted to the Detroit Medical Center from July 1st, 2020 to July 31st 2023. Patients will be placed into groups based on their time to administration of 4F-PCC from admission. Included patients are adults ≥ 18 years of age, with presence of ICH on imaging, currently taking an oral factor Xa inhibitor who received 4F-PCC for reversal of their intracranial hemorrhage. Exclusion criteria include: patients who received non-oral factor Xa inhibitors (warfarin, enoxaparin, heparin, dabigatran, fondaparinux), have a bleeding site other than ICH, received anticoagulation with heparin within 24h of reversal, have a history of a heparin allergy, or are pregnant. The primary outcome is defined as rates of hematoma expansion within 24 hours of receiving 4F-PCC stratified based on time-to-administration. Secondary outcomes include hematoma expansion at any time during hospitalization, hemostatic efficacy, incidence of neurosurgical interventions, rates of venous thromboembolism during hospitalization, and functional status at discharged based on the modified Rankin scale, and death due to neurologic outcome. Descriptive statistics will be computed for all study variables. Statistical tests include ANOVA, chi square tests, and Fisher's exact tests where appropriate.

Results:

Results will be presented at the 2024 Ohio Pharmacy Residency Conference.

Conclusions:

Discussion of the results, statistical analysis, and implications will be presented at the 2024 Ohio Pharmacy Residency Conference.

Addition of Single-Dose Aminoglycosides to Empiric B-Lactam Therapy in Septic Shock in a Setting with High Antimicrobial Resistance Rates

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Learning Objectives:

1. Evaluate current literature on the use of single-dose aminoglycosides in septic shock
2. Characterize outcomes associated with adjunct single-dose aminoglycoside administration to patients in septic shock at a facility with high levels of resistant gram-negative organisms

Purpose:
At the Detroit Medical Center (DMC), the standard of care has been to add single-dose aminoglycosides to β-lactam therapy in patients with septic shock due to high resistance rates; however, studies assessing the benefit this combination have yielded conflicting results. The objective of this study is to compare clinical outcomes between patients with septic shock in the emergency department who receive empiric antimicrobial regimens that include a β-lactam +/- a single dose of an aminoglycoside.

Methods:
This is a retrospective cohort study of patients admitted to DMC from May 2021 to July 2023. Patients meeting SIRS criteria who received vasopressors with a serum lactate greater than 2 mmol/L and were started on appropriate empiric antimicrobial therapy within 24 hours of admission at DMC were included. Patients were included in the aminoglycoside cohort if they received at least one dose of an aminoglycoside as part of an empiric antimicrobial regimen within 24 hours of admission; patients who did not receive any doses of aminoglycosides within 24 hours of admission were included in the control cohort. The primary outcome was all-cause mortality at 7 days, with secondary outcomes including 30-day mortality, hemodynamic stability 3 days after admission, clinical cure, and various safety outcomes. Key exclusion criteria included hypersensitivity to aminoglycosides, COVID-19-positivity, pregnancy or breastfeeding, burn injury, and transfer to hospice care within 96 hours of admission.

Results:
After screening for inclusion criteria, a total of 76 patients were included in the study analysis, n=38 in each group. Baseline characteristics significantly differed between percentage of patients with positive blood cultures, history of resistant gram-negative organism, and initial use of meropenem. 18 of 38 (47.4%) patients in the aminoglycoside group met the primary outcome of mortality at 7 days of admission compared with 15 of 38 patients (39.5%) in the control group (p=0.4875). Similarly, there were no statistically significant differences in 30-day mortality rate, rate of hemodynamic stability at Day 3, or percentage of acute kidney injury observed between the aminoglycoside and control groups.

Conclusions:
This study did not show a significant difference in efficacy- or safety-related outcomes among patients who received a single dose of an aminoglycoside in conjunction with standard empiric antimicrobial therapy in the setting of septic shock upon arrival to the emergency department compared to those who did not receive a single dose of an aminoglycoside alongside empiric therapy in this setting. Further studies, particularly prospective, randomized trials, are needed to better evaluate the effects of single-dose aminoglycoside administration in septic shock.

Pharmacist Managed Automated Insulin Delivery: Impact on % Time In Range

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UAN: 0048-0000-24-093-L01-P

Learning Objectives:

1. Explain how the management of automated insulin delivery systems by pharmacists enhance time spent within the target range more effectively than the current standard of care.
2. Compare % time-in-range (TIR) before and after starting Omnipod 5

Purpose:

The emergence of hybrid closed-loop automated insulin delivery systems has significantly advanced diabetes management by offering enhanced glycemic control and simplifying daily care routines. These state-of-the-art systems deliver insulin in real-time, adjusting doses based on glucose levels. Yet, despite their promise, comprehensive approaches to initiating, managing, and providing ongoing education and follow-up for these closed-loop systems remain underexplored.

Addressing these gaps is crucial for maximizing the benefits of automated insulin delivery systems. Pharmacists, with their specialized training, could play a pivotal role in offering uniform patient education and medication management. Additionally, the potential for using collaborative practice agreements could unite a range of healthcare professionals to provide more integrated and effective diabetes care. This proposed manuscript will describe the implementation and evaluation of pharmacist-led automated insulin delivery systems under collaborative practice agreement.

Methods:

The research will be conducted at a federally qualified health center in Northeast Ohio. Participants in the study will be those who have been diagnosed with either type 1 or type 2 diabetes receiving insulin therapy. A pharmacist acting under a collaborative practice agreement will initiate the patient on the automated insulin delivery system and will then manage, educate, and follow-up with them following initiation. The primary outcome variable is glycemic control, which will be assessed through the measurement of % time in range (TIR). These levels will be collected at baseline (before the initiation of the automated insulin delivery system) and at specified follow-up intervals. By utilizing this framework, the study aims to investigate whether pharmacist-led initiatives and education in automated insulin delivery systems can more effectively increase %TIR in underserved populations more effectively than the current standard of care.

Results:

N/A

Conclusions:

N/A

The Impact of MRSA Nasal Swab Cultures versus MRSA Nasal PCRs on Vancomycin De-escalation

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UAN: 0048-0000-24-094-L01-P

Learning Objectives:

1. Discuss the role of methicillin-resistant Staphylococcus aureus (MRSA) nasal screening in patients with pneumonia (PNA) based on previous literature.
2. Describe the differences between a MRSA nasal culture and a MRSA nasal polymerase chain reaction (PCR).

Purpose:

The use of MRSA nasal screening is recommended to aid in de-escalation of anti-MRSA therapy for patients with pneumonia. In March 2023, Trinity Health Oakland (THO) Hospital implemented a protocol allowing MRSA nasal cultures to be ordered for patients with suspected pneumonia. In August 2023, THO switched to MRSA PCR testing for quicker turnaround times. The purpose of this study is to evaluate the difference in performance of MRSA nasal cultures versus PCRs and the effects they have on vancomycin de-escalation, associated costs, and clinical outcomes for patients receiving vancomycin for pneumonia.

Methods:

This retrospective, single center study evaluated adult patients admitted to THO between March 2023 and February 2024. Patients who received a vancomycin dose with planned continuation of vancomycin therapy and had a MRSA nasal screening for pneumonia were included. Patients were excluded if they received MRSA nasal screening 72 hours or more after initiation of vancomycin, had non-pneumonia indications or were on vancomycin for multiple indications, had both a culture and PCR result prior to discontinuation of vancomycin, had vancomycin discontinued prior to a culture or PCR result, or had vancomycin discontinued due to death or being transitioned to comfort care measures. The primary outcome was length of vancomycin therapy in patients who had MRSA nasal cultures compared to those who had PCRs. The secondary outcomes included total milligrams of vancomycin received, number of vancomycin levels obtained, hospital length of stay, in-hospital mortality, vancomycin re-initiation, incidence of acute kidney injury, and readmission rates for a pneumonia infection.

Results:

Results will be presented at the 2024 Ohio Pharmacy Residency Conference.

Conclusions:

Conclusions will be presented at the 2024 Ohio Pharmacy Residency Conference.

A comparison of clinical outcomes: cefepime 2 grams every 12 hours versus 1 gram every 6 hours

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UAN: 0048-0000-24-095-L01-P

Learning Objectives:

1. Discuss the pharmacodynamics of cefepime
2. Describe the available evidence evaluating alternative methods to optimize cefepime pharmacodynamics

Purpose:

Cefepime exhibits bactericidal activity based on the percent of time the free drug concentration is maintained above the minimum inhibitory concentration (T>MIC). Prevalence of resistant organisms has led to evaluation of optimal cefepime dosing regimens. Based on Monte Carlo simulation studies, cefepime pharmacodynamics can be optimized by increasing the dose, increasing the dosing interval, or extending the time of administration. There is a lack of literature evaluating which optimization strategy is best. Trinity Health Oakland (THO), Livonia (THL), and Ann Arbor (THAA) recently updated renal dosing guidelines for cefepime in May 2023. Previously, cefepime standard dosing was 2 grams every 12 hours, and now patients with similar renal function instead receive 1 gram every 6 hours to better optimize pharmacodynamics and improve T>MIC. Although the total daily dose received in both groups is the same, there is limited evidence to evaluate the difference in dosing frequencies between 2g q12h vs 1g q6h. The objective was to evaluate if patients will have similar outcomes when comparing cefepime 2g q12h to 1g q6h.

Methods:

Multi-center, retrospective cohort study conducted at THO, THAA, and THL. Critically ill adults admitted 11/1/2022-11/1/2023 receiving cefepime either at 1g q6h or 2g q12h with significant exposure will be included. Patients will be excluded if they are a vulnerable population, have ESRD/dialysis, documented first positive culture result with cefepime resistance, or if cefepime was initiated on a general medical unit before ICU admission. The primary composite endpoint is clinical efficacy, defined as no escalation of treatment needed, no in-hospital mortality, and no readmission to ICU for recurrent infection. Secondary outcomes include: 30-day all-cause mortality and hospital readmission, duration of therapy, ICU and in-hospital length of stay, time on mechanical ventilation and vasopressors, rate of C. difficile infection, and incidence of documented cefepime-related encephalopathy.

Results:

To be presented at the conference

Conclusions:

To be presented at the conference

Intermittent Bolus Versus Continuous Infusion of Propofol for Procedural Sedation in the Emergency Department

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UAN: 0048-0000-24-096-L01-P

Learning Objectives:

1. Evaluate alternative administration strategies of propofol for adult procedural sedations.
2. Investigate safety outcomes of a new protocol created to utilize a continuous propofol infusion for adult procedural sedations.

Purpose:

The purpose of this prospective, chart review study is to compare safety profiles of intermittent boluses versus continuous infusions of propofol for procedural sedations.

Methods:

Administering propofol as a continuous infusion for adult procedural sedations is not frequently utilized in practice. Therefore, a protocol was created to provide guidance to administer continuous infusion propofol. Patients 18 years of age or greater undergoing a consented, procedural sedation between October 1st, 2023 through April 30th, 2024 in the emergency department at St. Vincent Medical Center are included. Exclusion criteria includes mechanical intubation prior to the procedure, propofol allergy, need for additional sedatives during or 30 minutes prior to the procedure, pregnancy, and incarcerated patients. The primary outcomes assess the development of apnea requiring supplemental oxygen and a 20% reduction in blood pressure, heart rate, or respiratory rate from baseline. Secondary outcomes evaluated are procedure time, individuals present during the procedure, total dose of propofol administered, and the use of pre-procedure medications. Tertiary outcomes focus on patient disposition and compliance to the protocol.

Results:

The protocol underwent one revision to address higher propofol doses required to achieve adequate sedation in patients previously analyzed. Data has been collected and analyzed for twenty patients in the intermittent bolus group and five in the continuous infusion group. Data collection is still ongoing for those in the continuous infusion group. Due to current enrollment, limited comparison can be done between the groups. To date, intermittent bolus dosing has been associated with a reduced rate of needing an escalation in oxygen supplementation (25% vs. 40%), lower total propofol dose (195.4 mg vs. 278.3 mg), shorter procedure time (17.25 minutes vs. 33.2 minutes), and less patients requiring hospital admission (45% vs. 60%).

Conclusions:

Final results and conclusions will be presented at the 2024 Ohio Pharmacy Residency Conference.

Assessing Lipid Targets: Evaluation of Optimal Lipid Lowering in General Internal Medicine Patients

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Sarah Lorenzen, PharmD, BCACP, CSP; Marilee Clemons, PharmD, BCACP; Sarah Aldrich Renner, PharmD, BCACP

UAN: 0048-0000-24-097-L01-P

Learning Objectives:

1. Discuss the medical and financial burdens of atherosclerotic cardiovascular disease (ASCVD)
2. Recall the lower low-density lipoprotein cholesterol (LDL-C) targets established by the 2022 American College of Cardiology (ACC) Expert Consensus, 2023 American Diabetes Association (ADA) guidelines, and 2023 American Association of Clinical Endocrinology (AACE) guidelines
3. Review a strategy to evaluate LDL-C target achievement among primary care patients that can be reproducible at other institutions

Purpose:

In 2022, heart disease and stroke collectively caused nearly 875,000 deaths in the United States, with $216 billion in annual healthcare costs and $147 billion in lost workforce productivity. Prevention and appropriate management of atherosclerotic cardiovascular disease (ASCVD) is becoming increasingly important. This study evaluates the integration of lower low-density lipoprotein cholesterol (LDL-C) targets established by the 2022 American College of Cardiology (ACC) Expert Consensus Decision Pathway and 2023 American Diabetes Association (ADA) guidelines into practice.

Methods:

A retrospective chart review was conducted utilizing electronic medical records of adult patients with clinical ASCVD receiving lipid-lowering therapy in an academic internal medicine clinic between January 1, 2023, and July 31, 2023. LDL-C targets were assigned based on the 2022 ACC Expert Consensus and 2023 ADA guidelines. The primary endpoint was achievement of assigned LDL-C target. Secondary endpoints included analyzing if lipid-lowering therapy was assessed for efficacy, provider identification of LDL-C targets and target-directed interventions. Data were analyzed using quantitative and qualitative statistics.

Results:

Of 375 screened patients, 319 were included for analysis and assigned an LDL-C target. Overall, 265 (83%) had a lipid panel drawn within a year of their provider visit, with 222 (70%) from January 1, 2023, or later. Only 91 (29%) patients met their assigned LDL-C target, leaving 228 (71%) suboptimally treated. Of these, only 18 (8%) had an LDL-C target identified by a provider, with 11 (61%) of them having inappropriate targets. Additionally, providers intervened to improve lipid control in only 23 (10%) of the 228 patients who had not reached their LDL-C target.

Conclusions:

Most primary care patients (71%) did not meet newer LDL-C targets, indicating a lack of adoption into practice. These findings will allow clinic pharmacists to improve clinic practices, implement guidelines, and address patient care gaps.

Metoprolol vs Diltiazem in Patients with Heart Failure and Atrial Fibrillation with Rapid Ventricular Response

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Jillian E. Davenport PharmD, BCCCP; Nathaniel T. Ehni PharmD, BCCCP

UAN: 0048-0000-24-098-L01-P

Learning Objectives:

1. Review current gaps in literature regarding use of diltiazem in atrial fibrillation (Afib) with rapid ventricular rate (RVR) and heart failure (HF)
2. Discuss the incidence of clinically relevant safety outcomes

Purpose:
Treatment of Afib with RVR is commonly achieved with intravenous (IV) beta blockers or IV non dihydropyridine calcium channel blockers (non-DHP CCB) per the American Heart Association guidelines, but can be difficult, and potentially harmful, in patients with comorbid HF due to negative ionotropic effects of non-DHP CCB. Current literature on safety and efficacy of non-DHP CCBs in HF in the acute setting is limited. This study aimed to add to literature by assessing the safety and efficacy of IV metoprolol and IV diltiazem.

Methods:
This is a retrospective cohort study conducted at the emergency department (ED) of an urban teaching hospital, from May 2021 to May 2023. Patients >18-years-old presenting to the ED with Afib with RVR and known HF. Patients were included if they received either IV metoprolol or IV diltiazem, were hemodynamically stable at baseline, and had an echocardiogram within 12 months. Patients were excluded if initial hemodynamic data was missing, patients received a non-study agent prior to or within 30 minutes of the study drug or were pregnant. The primary outcome was incidence of hypotension within 240 minutes of medication administration. Safety outcomes included incidence of bradycardia or increased oxygen requirements, acute kidney injury, need for vasopressors or inotropes, and mortality. Efficacy outcomes included heart rate (HR) control, need for cardioversion or secondary rate or rhythm control agents.

Results:
This study enrolled 40 patients, 15 metoprolol and 25 diltiazem. There were no significant differences in baseline characteristics, apart from a higher initial HR in the diltiazem group (p=0.032). No significant differences were found between groups regarding the primary outcome or secondary outcomes.

Conclusions:
This study, aligns with previous literature findings of no significant differences in safety or efficacy between IV metoprolol and IV diltiazem when used for HR control in Afib with RVR and comorbid HF.

Evaluation of Antibiotic Use and Glycemic Control in Patients Undergoing an Elective Total Hip or Knee Arthroplasty

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Sandra Hartnagle, PharmD, BCPS, BCIDP; Sapna Shah, PharmD, BCPS

UAN: 0048-0000-24-099-L01-P

Learning Objectives:

1. Describe the complications that surgical site infections can cause
2. Apply appropriate strategies to prevent surgical site infections in patients

Purpose:

Following a total joint arthroplasty, a surgical site infection is a complication that can occur. Surgical site infections can further lead to a prolonged duration of antibiotic therapy, unplanned hospitalizations, and increased morbidity and mortality. To help prevent surgical site infections, national guidelines recommend the prophylactic use of antibiotics and glycemic management perioperatively. With institutional guidelines in place to reflect this, assessing adherence identifies gaps in knowledge and areas for improvement. The purpose of this study was to characterize the usage of perioperative antibiotics, glycemic management, and to measure adherence to institutional guidelines at Corewell Health Beaumont Troy Hospital.

Methods:

This was a single-center, retrospective chart review of electronic medical records. Patients at least 18 years of age and undergoing an elective total hip arthroplasty or total knee arthroplasty between the dates of January 1, 2023, and May 31, 2023, at Corewell Health Beaumont Troy Hospital were assessed for inclusion. Patients were excluded if their procedure was emergent, received a concurrent surgery or total joint arthroplasty revision, had a previous surgical site infection at the surgical site, or were actively receiving antibiotics for a non-surgical indication. For patients with more than one total joint arthroplasty meeting criteria for inclusion during the designated time period, only the first encounter was included. Appropriate perioperative antibiotic prophylaxis and glycemic control was determined using criteria defined by existing literature and guidelines along with institutional guidelines. The primary endpoint of the study was to evaluate the number of patients who received appropriate antibiotic prophylaxis and glycemic management in accordance with institutional guidelines. Secondary endpoints included assessing the number of patients who experienced surgical complications which included surgical site infections within 30 and 90 days, surgical revision, intensive care unit admission, and death along with institutional guideline compliance in these patients. An additional secondary endpoint was characterizing perioperative antibiotic use in all patients included in the study. Descriptive statistics were utilized to analyze the data collected.

Results:

To be presented at the 2024 Ohio Pharmacy Resident Conference.

Conclusions:

To be presented at the 2024 Ohio Pharmacy Resident Conference.

Analysis of donor specific antibody and donor derived cell-free DNA (dd-cfDNA) prospective monitoring protocols in kidney transplant patients at high risk for rejection

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UAN: 0048-0000-24-100-L01-P

Learning Objectives:

1. Review literature supporting the use of dd-cfDNA in detecting early allograft injury.
2. Discuss the utility of implementing dd-cfDNA into high-risk monitoring protocols.

Purpose:
Prospective monitoring for early detection of rejection and subsequent intervention are essential for improvements in long-term allograft survival. Donor derived cell-free DNA (dd-cfDNA) has been proposed as a quantitative, noninvasive tool for utility in prospective monitoring as compared with standards of care. Dd-cfDNA identifies subclinical graft injury in advance of functional graft markers, such as serum creatinine (SCr) and estimated glomerular filtration rate (eGFR), and while donor specific antibody (DSA) testing has clinical utility in identifying antibody mediated rejection, it fails to provide the insight into acute cellular rejection that dd-cfDNA can. This study aims to evaluate the use of protocol-based dd-cfDNA testing as an early indicator of allograft rejection.

Methods:
This was a single center, institutional review board-approved, retrospective study evaluating high-risk kidney transplant recipients who underwent dd-cfDNA monitoring in accordance with institutional protocols for rejection monitoring. Patients were included if they received a kidney transplant at The Christ Hospital Health Network between February 2018 and November 2022, were classified as being high risk for acute cellular rejection (ACR) or antibody mediated rejection (AMR), were age 18 years and older, and received protocol-based dd-cfDNA testing. The primary outcome compared DSA, dd-cfDNA, and renal function (SCr, eGFR) at designated protocol time points for early identification of allograft injury. Secondary outcomes included mortality, graft survival, graft function, and correlation of dd-cfDNA, DSA, SCr and eGFR with biopsy results.

Results:
Of the 78 high-risk AMR/ACR patients evaluated, 37 met the inclusion criteria. Within this cohort, there were 33 biopsies done within the first post-operative year. Eleven patients were assigned to the rejection arm, and 26 patients were assigned to the rejection-free arm. There were 10 positive DSA results in 4 patients. All 4 patients fell into the rejection-free arm, leaving no opportunity to meaningfully correlate DSA with early allograft rejection. False negative results were reported in 36% of dd-cfDNA tests, with evidence of rejection upon biopsy, while 14% were false positive results. Mean SCr was more likely to be elevated when dd-cfDNA was elevated, and eGFR was similar between groups.

Conclusions:
This small retrospective study was unable to demonstrate that dd-cfDNA is an effective tool for identifying early rejection. Dd-cfDNA results should continue to be interpreted with caution alongside other markers of allograft rejection. Positive DSAs were caught early, leading to early intervention and prevention of rejection. This could be true of dd-cfDNA, but is difficult to demonstrate in this population due to a large portion of missing information at protocol time points.

Impact of N-acetylcysteine on Non-acetaminophen Acute Liver Injury

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Learning Objectives:

1. Review guideline-recommended treatment options for acute liver injury and acute liver failure.
2. Discuss the impact of N-acetylcysteine on non-acetaminophen induced acute liver injury.

Purpose:

Acute liver injury (ALI) is an emergent, life-threatening condition that occurs within days to weeks after an insult to the liver. ALI is diagnosed when liver transaminases are elevated from baseline without preexisting liver disease. If not addressed immediately, it can progress to acute liver failure (ALF), a rapid deterioration of liver function with evidence of coagulopathy and encephalopathy. N-acetylcysteine (NAC) has a well-established role in treatment for acetaminophen-induced ALI. Currently, the only available treatment options for non-acetaminophen-induced ALI are supportive care and liver transplant. Recent literature shows NAC may provide benefits for non-acetaminophen induced ALI.

Methods:

A retrospective chart review was performed utilizing data collected from medical records of patients treated within an eight-hospital network from January 1, 2019 to January 1, 2023. Patients included were adults 18 years and older with evidence of ALI defined as aspartate aminotransferase (AST) or alanine transaminase (ALT) more than five times the upper limit of normal. The intervention group included patients who received intravenous NAC within 48 hours of the initial elevated AST/ALT. The control group was matched based on degree of initial AST or ALT elevation, vasopressor use, and intubation status. Patients were excluded if they had a detectable acetaminophen level, received oral or inhaled NAC, had no repeat transaminase level between days 2 and 5, were pregnant, or had a history of pre-existing liver disease. The primary outcome of the study is the percent change in transaminases between the initial elevated level and repeat level collected between days 2 and 5. Secondary outcomes include hospital length of stay, intensive care unit (ICU) length of stay (LOS), and in-hospital mortality.

Results:

68 patients who received NAC were identified and met the inclusion criteria. Participants who met inclusion criteria without receiving NAC (the control group) were subsequently matched to the NAC group based on degree of AST/ALT elevation, intubation status, or vasopressor use. Baseline characteristics were similar between groups. The primary outcome, median percentage decrease in AST, was 82.7% in the NAC group vs 81.59% in the control group ($p=0.858$), and median percentage decrease in ALT, was 50.45% in the NAC group vs 53.48% in the control group ($p=0.158$). Secondary outcomes were not statistically different between groups.

Conclusions:

Use of NAC in non-acetaminophen induced ALI is not associated with a statistically significant improvement in transaminases, hospital LOS, ICU LOS, or mortality.

Monitoring Heparin Continuous Infusions and the Time to Achieve Therapeutic Anti-Xa Levels in the NICU

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Learning objectives:

1. Review the current DMC pediatric anticoagulation guidelines to determine compliance/adherence
2. Analyze the time to achieve therapeutic levels in neonates receiving treatment dosing of continuous heparin infusions for neonatal thrombosis
3. Describe the challenges of administration, assessment and interpretation of anticoagulation therapy in the neonatal healthcare setting

Purpose:

In the last two decades, venous and arterial thrombotic events in the pediatric population have been increasingly reported due to advancements in neonatal care. Amongst the pediatric patient population, newborns show the highest risk of developing thromboembolism due to altered levels of anticoagulant, procoagulant, and fibrinolytic factors. The mainstay of treatment is anticoagulation with unfractionated heparin (UFH). The purpose of this study is to establish the time to achieve therapeutic anti-Xa levels in neonates receiving continuous heparin infusions and to review the compliance to the current hospital system anticoagulation guidelines.

Methods:

This is a single-center, retrospective chart review examining the timeframe to achieve therapeutic anti-Xa levels in neonates that received UFH. Due to the low concentration of antithrombin (AT) in early infancy, the time to achieve therapeutic targets may be prolonged and require higher doses of UFH. The aim of this study is to determine the dose and time to achieve therapeutic anti-Xa levels after initiation of UFH and to assess the adherence to the current heparin dosing guidelines. This study will be conducted at Children's Hospital of Michigan (CHM). The primary endpoint is to determine the time to achieve therapeutic anti-Xa levels while on treatment dose UFH. Secondary endpoints include the assessment of clinical efficacy (thrombus resolution), adverse effects (bleeding, HIT), correlation between anti-Xa and aPTT levels, and mortality. Between 50-100 patient charts are expected to be reviewed in this retrospective study, based on the number of patients at CHM who present with a thrombotic event receiving heparin.

Results:

Results for this study are pending the completion of data collection and analysis. Upon completion, the findings will be analyzed and summarized. The final results will be provided in the final study report and will be presented at the 2024 Ohio Pharmacy Residency Conference.

Conclusion:

Conclusions for this study will be made after analysis of results and will be presented at the 2024 Ohio Pharmacy Residency Conference.

Barriers to the Utilization of Intravenous Pump Interoperability in the Hospital Setting

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Learning Objectives:

1. Define intravenous smart pump interoperability
2. Discuss how interoperability reduces infusion-related medication errors
3. Identify barriers to the utilization of smart pump interoperability

Purpose:
Smart pump interoperability allows infusion order parameters to pre-populate on the pump screen and automatically document data in the electronic health record. At sites where interoperability is available, it is not utilized by end users 100% of the time. Non-compliance causes safety gaps due to the pump operating in isolation of other electronic systems, requiring manual programming and documentation by the end users. The purpose of this study was to identify nurse-reported barriers to the utilization of intravenous pump interoperability in an acute hospital setting.

Methods:
The primary aim was to identify nurse-reported barriers to using interoperability. The study population included consenting registered nurses and licensed practical nurses at a single hospital setting. Secondary aims included comparison between groups to identify associations based on number of years of bedside patient care and nursing unit categorized by level of patient care.

Results:
Of 491 potential respondents, 87 participated in the survey. Of those respondents, 41 were excluded because they were neither currently practicing bedside patient care nor working on a unit with the interoperability function. Overall, when presented with a select-all question, the most selected barrier was wireless connection issues [39/46 (84.8%)]. When asked to select only the primary barrier, the most identified were wireless connection issues (48.9%), barcode not scanning (22.2%), and problems with electronic documentation (22.2%). When comparing responses between groups, it was determined that the groups were too small and there were too many categories and would therefore be underpowered to see any significant differences.

Conclusions:
The implementation of bi-directional smart pump interoperability has been shown to improve patient safety by reducing the number of manual keystrokes used during smart pump programming and associated risk of error. This survey found that the most common nurse-reported barrier to utilizing this safety tool was wireless connection issues.

Health-System Specialty Pharmacist Interventions Related to Patient Reported Outcome Measures

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Learning Objectives:

1. Outline the role of patient reported outcome measures (PROMs) in outpatient care
2. Identify potential interventions which can be conducted as a result of the collection of PROMs
3. Analyze the benefit of health-system specialty pharmacy in facilitating the collection of PROMs

Purpose:
Patient-reported outcome measures (PROMs) are questionnaires used to assess subjective data associated with a disease state. PROMs can improve provider understanding of patient symptoms, adherence, adverse events, and overall quality of life to guide patient care decisions. Despite the demonstrated benefits of PROM usage, barriers to implementation have led to underutilization and therefore, pharmacist interventions related to PROM collection are not well documented. Health system specialty pharmacies (HSSPs) are uniquely qualified to improve the implementation of PROMs through their relationship with providers and regular contact with the patient. The purpose of this study is to quantify PROM utilization and associated interventions and determine acceptance rates of interventions related to standardized PROM collection.

Methods:
This retrospective, multi-center, descriptive study reviewed PROM intervention data from October 2019 to August 2023. Interventions were included for patients ≥ 18 years of age who were clinically managed by HSSP and had at least one intervention related to a PROM. Interventions were excluded if they were incomplete. Utilized PROMs included patient reported missed doses, patient reported side effects, headache therapy determined effective, rescue Inhaler usage, Routine Assessment of Patient Index Data 3 (RAPID3), Multiple Sclerosis Activity Survey (MSAS), Asthma Control Test (ACT), Dermatology Life Quality Index (DLQI), Patient Oriented Eczema Measure (POEM), and COPD Assessment Test (CAT). Interventions were automatically triggered based on predetermined PROM response criteria. Each intervention was categorized by PROM type, reason for the intervention, pharmacist recommendation, and rate of acceptance.

Results:
A total of 9665 interventions were assessed. Most PROMs were collected by pharmacists (60.1%). Pharmacist recommendations included providing patient counseling (36.8%), continued monitoring (29.0%), and recommending an office visit (11.5%). PROMs most frequently leading to intervention include patient reported missed doses (37.8%), RAPID3 (25.0%), and patient reported side effects (15.4%). Most recommendations were accepted by the patient or provider (95%).

Conclusions:
HSSP utilization of PROMS allows for disease specific monitoring providing direct insight into the patient journey. HSSP teams are well positioned to effectively collect PROMs on a cadenced basis, allowing for proactive identification of therapy efficacy, side effect burden, and other crucial information affecting a patient's success on therapy. The HSSP high-touch communication model and standardized usage of PROMs presents opportunities for pharmacists to provide meaningful interventions, with the goal of increasing the quality of patient care.

Comparison of furosemide and bumetanide on time to transition to oral diuretic use in patients with acute decompensated heart failure

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Learning Objectives:

1. Review current literature on loop diuretic selection in the management of acute decompensated heart failure.
2. Discuss patient specific factors that may affect outcomes in patients utilizing loop diuretics for acute decompensated heart failure.

Purpose:
Intravenous (IV) loop diuretics are first-line agents in patients presenting with acute decompensated heart failure (ADHF) secondary to volume overload. Current guidelines do not list a preferred loop diuretic for management of ADHF and there is limited literature comparing the efficacy of available agents. The goal of this study was to determine whether there is a difference in time to transition to oral diuretic after receipt of IV furosemide versus IV bumetanide for patients with ADHF.

Methods:
This retrospective, single-center cohort study included patients admitted between January 1, 2020 and August 31, 2022. Adult patients admitted with a diagnosis of ADHF who received ≥1 dose of IV furosemide or IV bumetanide along with the same oral formulation at transition were screened for inclusion. The primary outcome was the time to transition to oral diuretic administration. Select secondary outcomes included incidence of acute kidney injury (AKI), hypokalemia, hypomagnesemia, 30-day readmission rate, all-cause mortality, appropriateness of initial IV diuretic dose, and time to subsequent heart failure hospitalizations (HFH).

Results:
A total of 208 patients were included in the final analysis with 104 patients in each group. Time to transition to oral diuretic use was 70.9 hours [54.1-110.4] with furosemide compared to 72.6 hours [45.1-118.7] with bumetanide (p= 0.972). Fewer bumetanide patients (25%) had appropriate initial IV diuretic doses than furosemide (90.4%) (p <0.001). Incidence of AKI was significantly higher in patients who received bumetanide compared to furosemide (33.7% vs 18.2%, p= 0.011). There were no significant differences in incidence of hypokalemia, hypomagnesemia, 30-day readmission, time to recurrent HFH, or all-cause mortality.

Conclusions:
Our study suggests no difference between IV bumetanide and IV furosemide at reducing time to oral diuretic use. These findings do not support a preferential use of IV bumetanide for patients presenting with ADHF.

The impact of vitamin C supplementation for the prevention of post-operative atrial fibrillation in thoracic surgery patients

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Learning Objectives:

1. Review current guideline recommendations for preventing perioperative/postoperative atrial fibrillation and flutter (POAF) for thoracic surgical procedures and available evidence for using Vitamin C in POAF prevention.
2. Analyze the effectiveness of vitamin C for POAF in thoracic procedures at St. Elizabeth Healthcare.

Purpose:

Cardiac complications, such as arrhythmias and ischemia occur in 10-15% of the thoracic surgery patient population. There is established literature about the use of vitamin C in the prevention of post-operative atrial fibrillation in cardiac procedures, though the use of the supplement in thoracic surgery is less researched. This study evaluates whether vitamin C supplementation in patients undergoing thoracic procedures is associated with a reduced incidence of POAF.

Methods:

This study was a retrospective analysis approved by the Institutional Review Board. The electronic medical record was utilized to identify all patients admitted from March 1, 2022 to September 30, 2023 who have undergone a thoracic procedure. Inclusion criteria included inpatients at St. Elizabeth Healthcare Edgewood who received medications from the thoracic post-operative order set, are 18 years of age or older, and have no documented history of atrial fibrillation prior to surgery. Exclusion criteria included patients that are pregnant, on any class I or class III antiarrhythmic medications, digoxin, on vitamin C supplement prior to admission, or with a sensitivity or allergy to vitamin c supplement. Baseline characteristics such as age, ethnicity, gender, BMI, smoker status, comorbidities, ejection fraction, renal function, procedure type, and preoperative medications were obtained via manual chart review. The primary outcome was the incidence of post-operative atrial fibrillation. Post-operative atrial fibrillation was defined as strip proven EKG showing an episode lasting over 10 minutes or requiring urgent intervention. The secondary outcomes included total hospital and intensive care unit length of stay, incidence of stroke post-procedure, readmissions to hospital and intensive care unit for treatment of post-operative atrial fibrillation, and mortality within the time frame of 30-, 60-, and 90-days post discharge.

Results:

Results will be presented at the Ohio Pharmacy Resident Conference.

Conclusion:

Conclusions will be presented at the Ohio Pharmacy Resident Conference.

Impact of Competency-Based Skills Assessments in an Advanced Pharmacy Practice Experience (APPE) Readiness Course

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Learning Objectives:

1. Identify characteristics of Competency-Based Pharmacy Education
2. Describe the potential benefits of Competency-Based Pharmacy Education on student learning

Purpose:

Competency-Based Pharmacy Education (CBPE) offers an opportunity to shift from traditional learning models to one that focuses on developing competencies in clinical skills, knowledge, and abilities. CBPE emphasizes five principles: (1) meets health care and societal needs, (2) is an outcomes-based model (3) de-emphasizes time, (4) has a learner-centered culture, and (5) includes authentic teaching and learning strategies aligned to assessments. While implementation of a wide-scale CBPE model requires further research, national collaboration, and substantial time and resources, there are opportunities to apply CBPE principles on a smaller-scale. The objective of this study was to determine the impact of competency-based practice assessments on student performance and perception of learning within an Advanced Pharmacy Practice Experience (APPE) readiness course.

Methods:

At The Ohio State University College of Pharmacy, students complete four stations within an Objective Structured Clinical Examination (OSCE) during an APPE readiness course. To demonstrate competency on each station, students must make no major errors per predetermined standards. As part of an educational intervention, students could demonstrate early competency through four optional practice sessions during the three months before the final OSCE. Students who made no major or minor errors during two separate practice sessions achieved early competency and were granted a “conditional satisfactory” on the corresponding final OSCE station. To compare outcomes for the objectives, students who earned a “conditional satisfactory” were required to attempt the corresponding final OSCE station; however, these students received a passing grade (regardless of errors made) if they made a genuine attempt at the discretion of course coordinators. Data were analyzed using descriptive and inferential statistics.

Results:

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

Conclusions:

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

Implementation of a Pharmacist Driven Protocol for Lipid Monitoring and Intervention in Patients Taking Atypical Antipsychotics

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Learning Objectives:

1. List the metabolic side effects of atypical antipsychotics
2. Evaluate the benefits of cholesterol lowering medications in patients taking atypical antipsychotics

Purpose:

Atypical antipsychotics or second-generation antipsychotics (SGA) can cause serious metabolic abnormalities, such as the risk of metabolic syndrome. Metabolic syndrome is the combination of abnormalities in weight, blood pressure, blood glucose, and lipid levels. Side effects of SGA medications have been demonstrated in as little as three months from initiation of the antipsychotic medication, only further emphasizing the need for proactive monitoring and treatment of adverse effects.

Methods:

This prospective review study will include adult patients admitted to Mercy Health- St. Charles Hospital who are taking any atypical antipsychotic medication during the time frame of the study. Under an approved pharmacy and therapeutics protocol, pharmacists can order lipid panels and initiate lipid-lowering therapy based on the 2019 ACC/AHA Guidelines for the Primary Prevention of Cardiovascular Disease. The aim of this study is to evaluate if a pharmacist-driven protocol for lipid monitoring and statin initiation in this patient population would improve the number of patients receiving appropriate cholesterol lowering therapy. The primary outcome of this study is to initiate the appropriate cholesterol lowering therapy based on the 2019 American Heart Association and the American College of Cardiology guidelines. The secondary outcome is to evaluate the amount of statin agents initiated and the number of lipid panels ordered.

Results:

Results are on-going

Conclusions:

N/A

Implementation of Pharmacist Led Inpatient Warfarin Management Within a Community Hospital

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Learning Objectives:

1. Evaluate effectiveness of inpatient pharmacist warfarin management in a community hospital
2. Compare pharmacist management to hospitalist management to assess patient outcomes

Purpose:

Warfarin is an anticoagulant used in the prophylaxis and treatment of thromboembolic events. Warfarin relies on maintaining INR within a therapeutic range to ensure safety and efficacy. Due to this narrow therapeutic index, it can lead to adverse events as well as variability in patients. Many hospitals have implemented pharmacist led warfarin management within their healthcare systems. This has been shown to improve outcomes as well as safety. Currently, warfarin is managed by physicians within Aultman Alliance Community Hospital. This study was designed to determine the effectiveness of initiating a quality improvement protocol for management of warfarin by clinical pharmacists in an inpatient setting at a community hospital.

Methods:

This study is a retrospective and prospective chart review of a quality improvement project with patients admitted to inpatient services who have received at least 1 dose of warfarin while hospitalized. Retrospective chart review of physician management of warfarin will be collected from December 1, 2022 to March 31, 2023 to compare with prospective data. Prospective chart review from November 1, 2023 to March 30, 2024 will be conducted of pharmacist warfarin management. Assessment of effectiveness in patient outcomes comparing physician management to pharmacist management will be completed. Inclusion criteria includes patients who are 18 years or older, received at least 1 dose of warfarin, and admitted to any of the following units: intensive care, progressive care, senior care, and 3 west for any indication at Aultman Alliance**.** Patients who have had warfarin therapy interrupted due to surgery will be excluded as well as those who only received one dose on the day before or day of discharge. Concomitant therapy with argatroban will also be excluded.

Results:

Results will be presented at the Ohio Pharmacy Residency Conference

Conclusions:

Regardless of study outcomes, Aultman Alliance plans to implement this protocol as the new standard of care moving forward. The results of this study will help determine the effectiveness of inpatient pharmacist management.

Evaluation of Appropriate Utilization of Proton Pump Inhibitors (PPI) for Gastrointestinal Bleeding (GIB) at a Community Hospital

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Learning Objectives:

1. Evaluate the utilization of proton pump inhibitors (PPI) for the indication of gastrointestinal bleed (GIB).
2. Discuss the prescribing and monitoring patterns of providers with PPI medications for GIB.
3. Analyze the de-escalation of PPI therapy based on diagnosis and procedure results.

Purpose:

The primary objective of this study is to evaluate the congruence between local utilization of high-dose proton pump inhibitors (PPI) and guideline recommendations for gastrointestinal bleed (GIB), including the indication, dose regimen and duration of therapy at a community hospital.

Methods:

Study design was approved by the University of Findlay's Institutional Review Board. This study is a single center, retrospective chart review at a community hospital performed in admitted patients of the institution based on utilization of a high-dose PPI in the setting of a GIB. High dose PPI therapy is defined as pantoprazole (Protonix) or esomeprazole (Nexium) 80 mg IV bolus once, followed by an 8 mg/min IV continuous infusion, or as 40 mg IV intermittent bolus injections every 12 hours. Patients were included in the study if they were adults 18 years of age or older, patients admitted to Mercy Health - Lorain Hospital between the dates of June 1st, 2023, through August 31st, 2023, and patients who were administered high-dose IV PPI regimen while inpatient as either intermittent or continuous infusion. Patients were excluded from the study if they were minors 17 years of age or younger, pregnant women of any gestational age, patients who developed a GIB due to post-operative or surgical complications with intra-abdominal surgery, patients prescribed a high-dose IV PPI for a diagnosis other than GIB, or who were transferred to another treatment facility (I.e., requiring a higher level of care, Veterans Affairs Medical Clinic (VAMC), etc.), or patients who were discharged from the Mercy Health - Lorain Hospital Emergency Department prior to being admitted for treatment. The primary outcome of this study was to determine the time (in hours) from initiation until discontinuation of high-dose IV PPI therapy for GIB. Secondary outcomes included determining potential cost savings related to duration of high-dose IV PPI therapy, determining the presence and duration of PPI orders at discharge, and to evaluate the timeline for conversion of high dose IV PPI to oral stepdown therapy.

Results:

The results of this study are pending the completion of data collection and analysis. Upon completion, the findings will be presented at the Ohio Pharmacy Residency Conference (OPRC).

Conclusion:

The results of this study will depict the prescribing and monitoring patterns of providers when utilizing PPI medication for the indication of GIB at a community hospital.

Impact of Pharmacist Intervention on Multiple Antipsychotics Prescribing in an Inpatient Psychiatric Facility

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Learning Objectives:

1. Recognize when multiple antipsychotics are indicated for a patient
2. Identify if multiple antipsychotics are appropriately being prescribed at the Mercy Health St. Charles Behavioral Health Institute

Purpose:

The Joint Commission created hospital based inpatient psychiatric services (HBIPS) scores as quality measures. HBIPS-5 specifically looks at patients discharged on multiple antipsychotic medications with appropriate justification. This is a yes/no scoring system. Appropriate justification includes previous failure of three trials of monotherapy, plan to taper/cross-taper to monotherapy, or augmentation of Clozapine. The previous HBIP-5 scores at St. Charles were 50% for the first and second quarter of 2023. Of note, the Centers for Medicare & Medicaid Services decided to remove the HBIP-5 measure for the 2024 Fiscal Year, so post-study HBIP-5 scores cannot be obtained. The aim of this study is to evaluate if multiple antipsychotics are being appropriately prescribed at the Mercy Health St. Charles Behavioral Health Institute.

Methods:

This study is a quality improvement opportunity and will be conducted at the Mercy Health St. Charles Behavioral Health Institute. This study will include adult patients admitted to the behavioral health unit on multiple antipsychotics, excluding multiple antipsychotics indicated for sleep, augmentation of depression and as needed antipsychotics. The pharmacist will do chart reviews to determine if appropriate justification for the prescribing of multiple antipsychotics is documented and identify opportunities for de-escalation. These recommendations will be made to the attending psychiatrist. If no de-escalation is warranted or the recommendation is rejected, the pharmacist will ensure that appropriate documentation per HBIP-5 is documented. The primary outcome is to identify the number of patients prescribed multiple antipsychotics. Secondary outcomes include to evaluate the number of pharmacist interventions that resulted in the de-escalation of anti-psychotic prescriptions, to identify the most common reason for prescribing multiple antipsychotics, and to evaluate the number of patients on multiple antipsychotics at baseline and after the study is completed.

Results:

Final results will be presented at the Ohio Pharmacy Residency Conference

Conclusions:

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

Characteristics of adult patients with diabetes admitted to an academic medical center for hypoglycemia events

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Learning Objectives:

1. List risk factors for hypoglycemia in patients with diabetes
2. Describe the patient population who may benefit most from a glucagon prescription based on American Diabetes Association (ADA) and/or American Association of Clinical Endocrinology (AACE) guidelines

Purpose:
Hypoglycemia often occurs in diabetes and can result in complications which negatively impact quality of life and increase mortality. The goal of this study was to describe the adult patient population with diabetes admitted to Mercy Health St. Vincent Medical Center for hypoglycemia.

Methods:
This was a retrospective chart review between September 1, 2022 to August 31, 2023 of adult patients with an admission reason of hypoglycemia. Those with type 1, type 2, or gestational diabetes, and taking any maintenance medications for diabetes were included. The primary outcomes were to describe the overall characteristics of the population and describe glucagon prescription patterns. The secondary outcomes were to categorize the level of hypoglycemia, describe home medications and assess hypoglycemia in elderly.

Results:
Seventy-four patients were included, with an average age of 65.7 years. Most were diagnosed with type 2 diabetes and the mean A1C was 7.2 % (standard deviation=1.9). In the year prior to admission, 66% had an episode of hypoglycemia. An outpatient prescription for glucagon was present prior to admission for 14.7% of those with level 2 or 3 hypoglycemia and for 19.4% of those taking insulin or sulfonylureas. At discharge, 2.7% received a glucagon prescription, and 89% were counseled on hypoglycemia. For secondary outcomes, 20.3% and 71.6% presented with level 2 or 3 hypoglycemia, respectively. Insulin and or sulfonylurea were home medications in 97.3% of patients. For patients 65 years and older, 8.7% had a glucagon prescription in the past versus 35.7% for those younger (p= 0.004).

Conclusion:
Recurrent hypoglycemia rates were high, while most patients did not have a glucagon prescription. Most patients experienced level 3 hypoglycemia and had high risk hypoglycemia home medications. Those 65 years old and older were less likely to have a glucagon prescription in the past versus younger patients.

Incidence of Acute Kidney Injury with Hydroxocobalamin Administration

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Learning objectives:

1. Describe why hydroxocobalamin may lead to acute kidney injury (AKI)
2. Identify if there is a correlation of AKI in patients with smoke inhalation injury who receive hydroxocobalamin compared to those who do not
3. State the incidence of AKI presented in this study in all patients who receive hydroxocobalamin regardless of indication

Purpose:

Hydroxocobalamin has emerged as the first-line agent for cyanide toxicity in patients with cyanide intoxication, especially those with smoke inhalation injuries. Despite the relative safety of hydroxocobalamin, it has recently been observed that patients who receive this treatment may be at an increased risk for acute kidney injury (AKI). The objective of this study is to build on existing literature to show if there is an association between the use of hydroxocobalamin and acute kidney injury.

Methods:

This study will be a retrospective chart review of patients admitted to Detroit Medical Center Hospitals from January 1st, 2013 to January 1st, 2023**.** Patients at least 18 years of age who received at least one dose of hydroxocobalamin or had a smoke inhalation injury were included. Patients who were discharged within 24 hours, expired within 72 hours of hospital admission, have a total body surface area (TBSA) burn > 60%, a history of renal replacement therapy or end stage renal disease, AKI on admission, prisoners or pregnant were excluded. Data points collected include age, gender, ethnicity, baseline renal function, relevant past medical history, inhalation injury grade and cause, percent TBSA burned, lactate on admission, lactate clearance at 72 hours, carboxyhemoglobin levels, number of doses of hydroxocobalamin received, and receipt of nephrotoxic agents, as well as urine output and serum creatinine throughout the first seven days of admission to determine occurrence of AKI. The primary outcome is comparing occurrence of AKI in the hydroxocobalamin group and no receipt of hydroxocobalamin in all smoke inhalation injury patients within the first seven days of admission. Secondary outcomes include the time to renal replacement therapy, all-cause 28-day mortality, and lactate clearance in smoke inhalation injuries, and incidence of AKI in all patients receiving hydroxocobalamin. The investigators will present categorical variables as frequencies/percentages and relevant values will be determined by Chi-square or Fisher's Exact Test. Continuous variables will be presented as means/standard deviations or medians/interquartile ranges and appropriate values will be calculated using Student's t-test or Mann Whitney U Test.

Results:

Final results will be presented at the 2024 Ohio Pharmacy Residency Conference.

Conclusion:

Discussion of results and statistical analyses will be presented at the 2024 Ohio Pharmacy Residency Conference.

Evaluation of Sodium-Glucose Cotransporter 2 Inhibitors in Preventing Hospital Readmission due to Acute Heart Failure Exacerbations

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UAN: 0048-0000-24-114-L01-P

Learning Objectives:

1. Review the 2022 AHA/ACC/HFSA Guideline for the Management of Heart Failure for important updates in regards to SGLT2 inhibitor use.
2. Evaluate the prescribing habits of the physicians at Blanchard Valley Hospital with regard to heart failure patients
3. Recognize the impact of guideline-directed medical therapy in hospital admission rates for heart failure exacerbations

Purpose:

In April 2022, AHA/ACC/HFSA released an update to the Guideline for the Management of Heart Failure. This update includes the addition of sodium-glucose cotransporter 2 (SGLT2) inhibitors for patients with heart failure with reduced ejection fraction, heart failure with mildly reduced ejection fraction, and heart failure with preserved ejection fraction. This study aimed to evaluate the prescribing of SGLT2 inhibitors to heart failure patients at the time of discharge from Blanchard Valley Hospital and assess the efficacy of these medications at preventing hospital readmissions.

Methods:

Using electronic medical records, all patients discharged from Blanchard Valley Hospital between January 1 and June 30, 2023 with a diagnosis of heart failure were identified using ICD-10 diagnosis codes. These patients were then evaluated for the utilization of SGLT2 inhibitors at the time of discharge. Patients readmitted to the hospital within 30 days and 6 months of discharge will be further identified and assessed for utilization of SGLT2 inhibitors. Secondary objectives included evaluation of optimization of guideline-directed heart failure regimens for all patients (i.e. renin-angiotensin-aldosterone system antagonist, beta-blocker, mineralocorticoid receptor antagonist, as needed diuretics), contraindications for use of SGLT2 inhibitors, and cardiology consultations placed during hospitalization.

Results:

Results will be presented at the Ohio Pharmacy Residency Conference in May 2024.

Conclusions:

Conclusions will be presented at the Ohio Pharmacy Residency Conference in May 2024.

Project Teamness: Examining Interprofessional Teamwork at a Federally Qualified Health Center

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Learning Objectives:

1. Discuss the concept of teamness in healthcare by identifying its evolution and recognizing core elements such as shared goals, mutual trust, and clear roles.
2. Analyze the impact of teamness on burnout, job satisfaction, patient satisfaction, and clinical outcomes in federally qualified health centers (FQHCs) to discern patterns and correlations.

Purpose:

Teamness has been synonymous with the effectiveness or functionality of a team; however, the term has evolved to define effective, interprofessional teamwork with specific components such as shared goals, mutual trust, and clear roles. Team-based care is a vital concept in quality patient care. While teamness has been studied within other settings, no published literature examines this construct in a federally qualified health center (FQHC), which face significant employee turnover. This study aims to measure teamness, using a validated assessment tool, within a multi-site FQHC to further understand the correlation between teamness and employee burnout, job satisfaction, patient satisfaction, and clinical outcomes.

Methods:

This cross-sectional study will assess employee perceptions of teamness within a multi-site FQHC through a voluntary, anonymous survey. The 30 question, paper survey includes a validated tool, the Assessment for Collaborative Environments (ACE-15), as well as questions assessing job satisfaction, perceived burnout, and demographics. The survey is designed to assess the core principles and values of effective team-based healthcare: shared goals, clear roles, mutual trust, effective communication, measurable processes and outcomes, and organizational support. The survey was distributed to patient-facing staff between 8/21/2023 – 11/6/2023. The following existing data was collected and stratified by health center: monthly patient satisfaction scores and clinical outcomes metrics. Descriptive statistics will be used to summarize the data and inferential statistics will assess for associations between teamness and employee burnout, job satisfaction, patient satisfaction, and clinical outcomes.

Results:

189 surveys were distributed to eligible staff; 160 surveys were returned (84.7% response rate). Data analysis in progress.

Conclusions:

The research team will summarize employee perceptions of teamwork at the health centers, which could lead to quality improvement projects. This study will allow health center leadership to identify models of care and health center attributes that lead to better patient satisfaction, job satisfaction and enhanced outcomes. These models can be shared and mirrored at other health centers nationally.

Clinical interventions for amiodarone pulmonary toxicity and monitoring

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Learning Objectives:

1. Review use, toxicity, and current evidence for amiodarone monitoring
2. Describe amiodarone monitoring within pharmacist-led antiarrhythmic clinic

Purpose:

Amiodarone is a class III antiarrhythmic drug that is used for treatment of ventricular and atrial arrythmias. Amiodarone is highly effective, but due to its pharmacokinetic properties, is associated with a range of toxicities affecting multiple organ systems, including the lungs. Due to these toxicities, frequent monitoring is required. Per amiodarone package insert, baseline pulmonary function testing (PFT) and chest X-ray should be completed to monitor for pulmonary toxicity. However, repeat testing varies in clinical practice from standard intervals to symptom-driven due to differences in available data. PFT should include a diffusing capacity of the lung for carbon monoxide (DLCO), which assesses gas transfer during respiration. Some studies indicate DLCO reductions of 15-20% being suggestive of pulmonary fibrosis and potential amiodarone induced pulmonary toxicity. However, data is limited surrounding the use of DLCO monitoring for amiodarone toxicity. The purpose of this study is to determine an appropriate reduction threshold of DLCO for which further evaluation and testing are indicated.

Methods:

This is a single center, retrospective, cohort study that includes patients seen in a pharmacist-run antiarrhythmic medication monitoring clinic between January 1st, 2013 and July 1st, 2023. Additional inclusion criteria are patients between the ages of 18-89 with available baseline PFT with DLCO, on amiodarone for at least 3 months, and a DLCO reduction of ≥10% at repeat testing. The primary outcome will be the incidence rates of interventions following DLCO or DLCO/volume of alveoli (VA) reductions of ≥10% to <20% versus ≥20%. Secondary outcomes include incidence rates of DLCO/VA decreases vs. DLCO decreases, new abnormalities on chest imaging, documentation of new pulmonary symptoms, and incidence of clinical interventions in patients with a reduction of DLCO within the normal patient-specific predicted range versus below the normal patient-specific predicted range.

Results:

Final results will be presented at the conference.

Conclusions:

The data for this study will determine ongoing trends in clinical interventions surrounding DLCO reductions for patient on amiodarone.

Effects of a Conservative Enoxaparin Bridging Protocol for Subtherapeutic INRs in Patients with HeartMate 3 Left Ventricular Assist Device

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Learning Objectives:

1. Review current literature for bridging subtherapeutic INRs in outpatients with left ventricular assist devices.
2. Discuss the results of implementing a more conservative bridging protocol in patients with a HeartMate 3 left ventricular assist device.

Purpose:
Our outpatient left ventricular assist device (LVAD) clinic implemented a more conservative enoxaparin bridging protocol for patients with subtherapeutic international normalized ratios (INRs) and HeartMate 3 (HM3) devices. This retrospective review assessed whether this new protocol correlated with a reduction in major bleeding and thrombotic events.

Methods:
This institutional review board-approved retrospective, single-center, pre-post cohort study compared patients who had subtherapeutic INRs treated according to the previous protocol and those treated according to the new, more conservative protocol. The review included outpatients with a HM3, a target INR ≥2, and a subtherapeutic INR (defined as INR <1.6). Patients with a history of heparin-induced thrombocytopenia, recent or multiple gastrointestinal bleeds, noncompliance with INR checks, dialysis, and inpatient bridging episodes were excluded. The primary outcome was the composite of major bleeding events (MBEs) within seven days and thrombotic events (TEs) within 30 days after a subtherapeutic INR episode. Secondary outcomes included the composite of MBEs and TEs within 30 days of a subtherapeutic INR episode and rates of minor bleeding.

Results:
Eighty-two patients (49 pre vs 59 post) and 237 subtherapeutic episodes (105 pre vs 132 post) were included. The rate of the primary composite outcome occurred in 5.7% and 1.5% of the pre-group and post-group, respectively (p = 0.075). The secondary composite outcome of MBEs or TEs within 30 days was significant reduced in the post-group (10.5% vs 3.8%, p = 0.041). The rate of TEs appeared similar but was numerically lower in the post-group (1.0% vs 0.8%, p = 1.00). The rate of MBEs within 30 days was reduced in the post-group (10.5% vs 3.0%, p = 0.019). In a subgroup of patients taking concomitant antiplatelet therapy, the primary composite outcome was significantly reduced in the post-group (5.1% vs 0.0%, p = 0.044).

Conclusion:
Routine bridging of subtherapeutic INRs in patients with a HM3 device may be both unnecessary and harmful. A conservative bridging protocol at a single institution suggested a reduction in MBEs without increasing the rate of TEs among HM3 patients. Larger studies are necessary to confirm the results.

Short vs Long-Course Antibiotic Therapy in Uncomplicated Gram-Negative Bacteremia from Non-Urinary Sources

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Learning objectives:

1. Outline the differences between complicated and uncomplicated gram-negative bacteremia
2. Recommend an appropriate oral antibiotic regimen for the treatment of uncomplicated gram-negative bacteremia

Purpose:
One major cause of morbidity and mortality in hospitalized patients is gram-negative bacteremia. Data to guide treatment duration for uncomplicated gram-negative bacteremia from non-urinary sources is limited.

Methods:
This retrospective, noninferiority trial compared clinical efficacy of treatment with a short-course (7-10 days) versus long-course (>14 days) antimicrobial regimen. Hospitalized adult patients with gram-negative microbiological culture data treated with effective antibiotic therapy for a minimum of 7 days were included if they achieved defervescence and hemodynamic stability within 72 hours. Patients with complicated gram-negative bacteremia were excluded. The primary outcome was a composite of recurrent infection with the same bacterial species within 90 days of completing treatment and 90-day all-cause mortality from date of completing treatment. The noninferiority margin was set at 10%. Secondary outcomes included hospital length of stay, discharge on intra-venous antibiotics, and completion of therapy while inpatient.

Results:
In total, 11 patients were analyzed in the short-course and 24 patients in the long-course. The primary composite endpoint occurred in 1 of 11 (9.1%) patients in the short-course compared to 4 of 24 (16.7%) in the long-course (risk difference, -7.6% [95% CI, -30.1 to 15.0%]). Statistically more patients completed therapy inpatient without a difference in length of stay in the short-course (5 of 11 [45.5%] vs. 2 of 24 [8.3%]; P = 0.021).

Conclusions:
This study showed inconclusive differences in outcomes between 7-10 days and ≥ 14 days of therapy for patients with uncomplicated gram-negative bacteremia from non-urinary sources in terms of mortality, recurrent infection rate, and development of resistant infections.

Real-World Analysis of Adjuvant Abemaciclib in High-Risk HR+/HER2- Early-Stage Breast Cancer

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Learning Objectives:

1. Recognize the breast cancer treatment paradigm for hormone receptor positive (HR+) and human epidermal growth factor receptor-2 negative (HER2-) subtype
2. Describe patient demographics and cancer characteristics of early breast cancer patients on adjuvant abemaciclib and endocrine therapy at a large community hospital
3. Describe the treatment course of patients taking adjuvant abemaciclib including dose modifications, duration of therapy, and documented adverse effects

Purpose:
The purpose of this study is to describe patient demographics and cancer characteristics of early-stage breast cancer patients on adjuvant abemaciclib with endocrine therapy and provide real-world data of the patient experience throughout their treatment course of abemaciclib.

Methods:
A retrospective chart analysis was conducted on all patients aged 18 years and older who initiated adjuvant abemaciclib for early-stage HR+/HER2- breast cancer under the care of an OhioHealth physician between October 1, 2021, and September 30, 2022. Data were collected until discontinuation of abemaciclib or October 1, 2023, whichever came first. Descriptive statistics were used to describe all data. Patient demographics, prior chemotherapy, and choice of endocrine therapy were recorded. Additionally, adverse events (AEs), dose modifications, and duration of therapy were documented. Although not an aim of this study, disease progression or recurrence was recorded if available.

Results:
Eighty patients were assessed for eligibility; 33 patients met inclusion criteria. All patients were of HR+ and HER2- subtype. Of these, 31 (94%) received prior chemotherapy prior to starting abemaciclib. By the American Joint Committee on Cancer grading criteria, 23 (70%) patients had stage III disease and 10 (30%) had stage II disease. At data cutoff, 20 (61%) were still on active therapy with abemaciclib, 11 (33%) discontinued treatment due to adverse effects or at the patient/prescriber's discretion, and 2 (6%) discontinued due to recurrence. Median duration of therapy at data cutoff, excluding patients that discontinued due to recurrence, was 13 months (7-16). Of patients that discontinued treatment due to adverse effects, median duration of therapy was 5 months (3-9). Ninety-one percent of patients required at least 1 documented dose modification. Top 3 documented side effects that prompted dose modifications were diarrhea (70%), fatigue (33%), and myelosuppression (12%).

Conclusions:
When compared to monarchE, the present study demonstrated that at a large community health system, a higher proportion of patients discontinued abemaciclib and/or required dose modifications, but a lower proportion of documented instances of AEs. With the high monitoring profile of abemaciclib and burden patients experience while on therapy, further studies are needed to individualize CDK4/6 inhibitor therapy and optimize risk reduction strategies.

Early conversion to oral antibiotics in non-severe community acquired pneumonia

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Learning Objectives:

1. Describe the current practice guidelines for antibiotic therapy in community-acquired pneumonia (CAP) patients
2. Discuss the value of antibiotic stewardship interventions in an inpatient setting

Purpose:
Current guidelines support varying durations of intravenous (IV) and oral antibiotic therapy for community acquired pneumonia (CAP). Previous research suggests earlier conversion to oral therapy may reduce healthcare utilization without affecting outcomes. This project aimed to assess an initiative to convert non-severe CAP antibiotics to early oral therapy and decrease antibiotic exposure.

Methods:
This project was approved as a quality improvement determination by the OhioHealth Office of Human Subjects Protections. The study was a retrospective, single-center cohort assessment of patients with non-severe CAP admitted to medical-surgical level of care during a 3-month intervention period in 2023, compared with a pre-intervention period from the same 3 months in 2022. Goal antibiotic therapy during the intervention included a one-time dose of IV azithromycin and ceftriaxone followed by four days of oral cefuroxime. The primary outcome was median IV antibiotic therapy days. Secondary outcomes included median total days of antibiotic therapy, antibiotic cost, and hospital length of stay stratified by discharge disposition. Outcomes were compared descriptively.

Results:
Pre-intervention group in 2022 consisted of 78 patients and post-intervention group in 2023 consisted of 88 patients. Median days of IV antibiotic therapy was lower by 1 day post-intervention (3 vs. 2). Median total days of antibiotic therapy was lower by 1 day (7 vs. 6) though antibiotic costs were comparable ($58.48 to $57.39). Median length of stay, when stratified, was higher by 0.5 days for home-going patients and lower by 7.5 days for facility-going patients in 2023. The facility-going group included 10.3% of patients in 2022 and 6.8% in 2023.

Conclusions:
A pharmacist-initiated antibiotic stewardship intervention in non-severe CAP patients was associated with a decrease in duration of IV and total antibiotic therapy. Prospective studies including 30-day readmission rates and direct and indirect costs of care would help further investigate safety and cost-effectiveness outcomes.

Fixed Dose Four-Factor Prothrombin Complex Concentrates for Reversal of Factor Xa Inhibitors in Patients with Intracranial Hemorrhage

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Learning Objectives:

1. Review the current dosing recommendations for reversing factor Xa inhibitor-associated intracranial hemorrhage (ICH) with four-factor prothrombin complex concentrates (4F-PCC)
2. Discuss the impact of fixed-dose versus weight-based dosing of 4F-PCC on patient outcomes in the context of intracranial hemorrhage

Purpose:
Intracranial hemorrhage (ICH) presents a significant complication in patients on oral anticoagulants such as factor Xa inhibitors (FXaIs). Rapid anticoagulation reversal is critical to patient outcomes. While four-factor prothrombin complex concentrates (4F-PCC) are recommended for this purpose, the optimal dosing strategy has not been established. Protocols vary widely, ranging from fixed low doses to traditional weight-based dosing. Originally, the standard 4F-PCC dosing protocol was 50 units/kilogram. However, emerging evidence from observational studies indicate that lower fixed doses might yield similar clinical outcomes. The purpose of this study is to compare the safety and efficacy of a fixed 2,000-unit dose of 4F-PCC against the traditional weight-based dosing in patients with FXaI-associated ICH.

Methods:
This was a retrospective review conducted at a level 1 trauma and comprehensive stroke center. Adult patients who received 4F-PCC for FXaI-associated ICH from January 2022 to September 2023 were included. Patients were divided into two groups based on receiving a fixed 2,000-unit dose or a weight-based 50 units/kilogram dose of 4F-PCC. The primary outcome was the stability of ICH on follow-up CT scans, with secondary outcomes including mortality, thrombotic events, and lengths of ICU/hospital stay.

Results:
Eighty-two patients were eligible, with 41 in each dosing group. No significant difference was observed in hemorrhage stability between the two groups (p=1.000). Both groups exhibited similar outcomes for secondary endpoints, including ICU/hospital stay lengths and mortality rates. The fixed-dose group received a significantly lower dose per kilogram compared to the weight-based group, (26.5 units/kg vs 49.0 units/kg) without affecting the clinical outcomes.

Conclusions:
The study suggests that a fixed 2,000-unit dose of 4F-PCC is as effective and safe as weight-based dosing for reversing FXaI-associated ICH. This fixed-dose approach could offer a cost-effective and simplified alternative in clinical practice.

Set for Success: Improving the Timing of Vancomycin in Patients who Present to the ED with Sepsis

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UAN: 0048-0000-24-122-L01-P

Learning Objectives:

1. Review current guideline recommendations regarding antibiotic administration in sepsis patients
2. Discuss strategies that can be utilized to reduce the time to vancomycin verification and administration

Purpose:

Early antibiotic administration is one of the most effective interventions for mortality reduction in sepsis; this includes vancomycin for patients at high risk for MRSA. At Summa Health System (SHS), Emergency Department (ED) sepsis order panels include a vancomycin 15 mg/kg or 20 mg/kg loading dose, which requires an updated weight. All vancomycin doses are dispensed from the main pharmacy at SHS-Akron Campus (SHS-AC). Either of these factors could delay therapy. The objective of this quality improvement (QI) initiative was to evaluate the impact of utilizing estimated weight-based dose selection of vancomycin in ED order panels and stocking vancomycin in the ED automated dispensing cabinets (ADCs) on the time to first dose of vancomycin for ED patients who present with concern for sepsis.

Methods:

ED charts for patients at SHS-AC or SHS-Barberton Campus who received a loading dose of vancomycin from "ED Panel Sepsis" or "ED Panel Antibiotics Panel" were reviewed before and after the changes. The primary endpoint was mean time from vancomycin order placement to administration. Secondary endpoints included 30-day inpatient all-cause mortality, average dose, and percent of "Pharmacy to Dose Vancomycin Consults" ordered.

Results:

The mean time from vancomycin order placement to administration was less but not statistically significant for the new ED panel group compared to the old ED panel group (106.2 minutes vs. 121.4 minutes, p=0.392). There was a significant reduction in mean time from order placement to verification in the new ED panel group (8.1 minutes vs. 23.6 minutes, p=0.011). The mean time from order placement to administration was less for ADC dispense compared to pharmacy dispense (98 minutes vs. 121.9 minutes) within the new ED panel group, but the cohorts were too small to perform statistical comparison. There were no differences in 30-day inpatient all-cause mortality or consults ordered. The mean loading dose was 22.5 mg/kg in the new ED panel group.

Conclusions:

Estimated weight-based dose selection of vancomycin within ED order panels showed a statistically significant reduction in time from order placement to verification. Though the reduction in time from order placement to administration was not significant, the reduction in time until order verification improved one of the many factors that can contribute to delayed antibiotic administration for sepsis patients in the ED.

Impact of Intraoperative Blood Glucose Control on Morbidity and Mortality in Cardiac Surgery

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Learning Objectives:

1. Identify patient-specific risk factors for intraoperative hyperglycemia during cardiac surgery
2. Discuss the impact of controlling glucose levels intraoperatively on postoperative morbidity and mortality

Purpose:
Perioperative hyperglycemia can occur during cardiac surgery and leads to increased rates of postoperative morbidity and mortality. However, tight glycemic control improves postoperative outcomes. Guidelines emphasize maintaining glycemic control perioperatively and recommend use of continuous insulin infusions to maintain blood glucose levels < 180 mg/dL. The purpose of this study was to evaluate the impact of maintaining intraoperative glucose levels < 180 mg/dL on postoperative morbidity and mortality following cardiac surgery.

Methods:
This was a single center, retrospective cohort study that utilized electronic health records and the Society of Thoracic Surgeons database to collect data for adult patients who underwent cardiac surgery with cardiopulmonary bypass between January 1, 2022 and January 1, 2023. Patients were considered to be controlled if all intraoperative blood glucose levels were < 180 mg/dL and uncontrolled if $\geq$ 1 intraoperative blood glucose level was $\geq$ 180 mg/dL. The primary outcome was a composite of 30-day mortality and morbidity including surgical site complications, sepsis, positive blood cultures, pneumonia, stroke, and myocardial infarction. Secondary outcomes included individual components of the primary outcome, intensive care unit and hospital length of stay, and new onset arrhythmias.

Results:
This study included 473 patients (265 patients in the controlled group, 208 patients in the uncontrolled group). Baseline characteristics were similar between groups; however, the uncontrolled group included more patients with diabetes. The controlled group received less insulin intraoperatively than the uncontrolled group (6 [2.7-19,2] units vs 16.8 [10.5-25.2] units; p<0.001). Composite 30-day postoperative morbidity and mortality was similar between the controlled and uncontrolled groups (41 events [15.5%] vs. 41 events [19.7%], p=0.227). There were no differences in secondary outcomes between the two groups.

Conclusions:
There was no difference in 30-day morbidity and mortality between patients with intraoperative blood glucose levels < 180 and $\geq$ 180 when undergoing cardiac surgery.

Guanfacine Versus Clonidine for Discontinuation of Dexmedetomidine and Withdrawal Prevention in Critically Ill Patients

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Learning Objectives:

1. Discuss the role of enteral alpha-2 agonists in the discontinuation of dexmedetomidine and withdrawal prevention
2. Review the pharmacologic differences between guanfacine and clonidine and how it relates to dexmedetomidine withdrawal

Purpose:

Compare the efficacy and safety between patients who received enteral clonidine or guanfacine for the purpose of dexmedetomidine discontinuation and withdrawal.

Methods:

This multi-institutional, retrospective, cohort study included patients aged 18 years or older, admitted to an ICU from 01/01/2018 through 11/1/2023, and on continuous infusion dexmedetomidine while receiving at least one dose of either enteral clonidine or guanfacine. Patients were excluded if they were pregnant or on clonidine or guanfacine prior to admission. The primary outcome is the rates of dexmedetomidine discontinuation within 48 hours of the first dose of either enteral clonidine or guanfacine. The secondary outcomes were rates of adverse drug reactions while on the enteral study medication and incidences of withdrawal after discontinuation of dexmedetomidine, defined as a Richmond agitation-sedation score of greater than +1, systolic blood pressure greater than 180 mmHg, or heart rate greater than 100 beats per minute. For a probability level of 0.05 we estimated that 89 patients in the guanfacine group and 178 in the clonidine group would provide at least 80% power to detect a difference of 17% in the primary outcome. The primary outcome will be analyzed via chi-square test. Continuous variables will be reported as means and standard deviations. Dichotomous and categorical variables will be reported as frequencies with percentages.

Results:

Data analysis is ongoing and results will be presented at the 2024 Ohio Pharmacy Resident Conference.

Conclusions:

To be presented at the 2024 Ohio Pharmacy Resident Conference.

Ceftriaxone Plus Doxycycline or Azithromycin for Inpatient Treatment of Community-Acquired Pneumonia

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Learning Objectives:

1. Review clinical guidelines for antimicrobial treatment selection in patients with community-acquired pneumonia
2. Discuss the clinical outcomes between patients treated with ceftriaxone and doxycycline or azithromycin for inpatient treatment of community-acquired pneumonia

Purpose:

Community-acquired pneumonia (CAP) is a leading cause of emergency room visits and hospitalizations. Respiratory fluoroquinolones and macrolides plus a beta-lactam are well established first line therapies in the treatment of non-severe inpatient CAP. Though doxycycline is recommended as first line in the outpatient setting, the Infectious Disease Society of America (IDSA) recommends doxycycline plus a beta-lactam as a third line option for hospitalized patients with non-severe CAP. This recommendation for inpatient treatment is based on low-quality evidence. Per the IDSA CAP guidelines, there is a need for higher-quality evidence to support the use of treatment with a beta-lactam and doxycycline. This study aims to identify whether there is a significant difference in clinical outcomes for patients hospitalized with CAP and treated with either ceftriaxone plus azithromycin or ceftriaxone plus doxycycline.

Methods:

This is a retrospective cohort study comparing ceftriaxone with doxycycline or azithromycin for the treatment of hospitalized patients with CAP. Data will be collected from four hospitals within the Detroit Medical Center from July 1, 2022 through July 31, 2023. Adult patients diagnosed with CAP that received at least 48 hours of treatment with the study antibiotics will be included. Exclusion criteria includes pregnancy, coinfection with influenza, RSV, or COVID-19, diagnosis of complicated pneumonia, and immunocompromised status. The primary outcome will be clinical success at the end of therapy defined as resolution or improvement in signs and symptoms of CAP, no change to broader antibiotic therapy after >72 hours of treatment, and hospital discharge. Secondary outcomes include inpatient mortality, time to clinical stability, and adverse drug events secondary to prescribed antibiotics. Categorical variables will be presented as frequencies or percentages and analyzed utilizing Chi-square or Fisher's Exact Test. Continuous variables will be presented as medians with interquartile ranges and analyzed using Student's t-test or Mann Whitney U test. Independent predictors of clinical failure will be identified with multivariate linear regression. Outcome relevance will be determined based on bivariate comparisons where variables with $p < 0.1$ or biological plausibility will be included.

Results:

Results will be presented at the 2024 Ohio Pharmacy Residency Conference.

Conclusions:

Results of this study will further characterize the comparative clinical outcomes between ceftriaxone plus doxycycline or azithromycin in the inpatient treatment of community-acquired pneumonia. Final conclusions will be presented at the 2024 Ohio Pharmacy Residency Conference.

Evaluating the Validity of L-mMRC (Long-Term Care Modified Medical Research Council) Severity Tool Versus mMRC Tool in Staging COPD in the Skilled Nursing Setting

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Learning Objectives:

1. Recognize the necessity for a COPD symptom assessment tool adapted to resident level-of-care, cognition, and ambulatory status in the skilled nursing facility (SNF) setting
2. Classify ABE designation of SNF residents with COPD using the L-mMRC tool compared to the mMRC tool

Purpose:

In older adults with COPD, physical and cognitive impairments present challenges in disease state management, including difficulty in diagnosis, suboptimal medication administration, and increased number of comorbidities. Treatment of skilled nursing facility (SNF) residents with COPD is difficult when clinical assessments are not adapted to level-of care, cognition, and ambulation. The L-mMRC is an assessment tool developed by consultant pharmacists in collaboration with SNF nursing/administrative staff. Like the mMRC scale, it ranges from grades 0 to 4. Compared to the mMRC scale, the L-mMRC scale incorporates self-performance codes for ambulation.

Methods:

This retrospective study aims to evaluate the validity of the L-mMRC scale in staging residents with COPD in the SNF setting. Consultant pharmacists identified residents for study inclusion via a chart review. Study participants were ≥ 65 years old with a COPD diagnosis from two SNFs located in southwest Ohio. Residents with an active asthma diagnosis or receiving hospice care were excluded. Residents who met study inclusion criteria were evaluated using the L-mMRC scale.

Results:

Of 256 residents reviewed, 86 met study inclusion criteria. 58 (67.4%) residents were female. Average age was 76 years. Residents were on 0 to 5 (mean=1) COPD medications. Not all residents were up to date on vaccinations recommended in the GOLD 2024 report. Average L-mMRC score was 2.67 with a mode L-mMRC score of 3. mMRC scores were located in 0 patient charts.

Conclusions:

Breathlessness is a key symptom in many patients with COPD. Therefore, obtaining baseline dyspnea is essential for subjectively staging patients' GOLD group and determining appropriate pharmacotherapy. Future assessment of patients' mMRC grades with assistance from respiratory therapists will be required to evaluate the validity of the L-mMRC scale. Utilization of a subjective, validated assessment performed by caregivers could assist in guideline-directed COPD management. This further substantiates the current gap in COPD management for SNF patients and the need for the L-mMRC tool.

Four Factor Prothrombin Complex Concentrate (4FPCC) versus Activated 4FPCC (a4FPCC) for Acute Direct Xa Inhibitor Bleeding

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Learning Objectives:

1. Describe the non-specific agents used for management of acute direct Xa inhibitor bleeding.
2. Discuss the safety of four factor prothrombin complex concentrate (4FPCC) versus activated 4FPCC (a4FPCC) for the management of acute direct Xa inhibitor bleeding.

Purpose:
Direct Xa inhibitors have become the preferred anticoagulants for stroke prevention in patients with atrial fibrillation and for the treatment of venous thromboembolism. Recommendations for the management of acute direct Xa inhibitor bleeding vary. Two current non-specific strategies include 4FPCC or a4FPCC. The goal of this project is to compare the safety and efficacy of 4FPCC and a4FPCC for the management of acute direct Xa inhibitor bleed.

Methods:
This retrospective, single-center IRB-approved cohort study of adult patients receiving a non-specific reversal agent for apixaban, or rivaroxaban acute bleeding was conducted in 2 parts. Part 1 evaluated a4FPCC [August 2016 – July 2019]. Part 2 evaluated 4FPCC [June 2021 – June 2023]. Patients were excluded for emergent surgical reversal without bleeding. Data extraction included patient demographics, history of thromboembolism, anticoagulant indication, bleeding location and management, and thrombotic events. The primary safety outcome was 30-day post-reversal thromboembolism. Key secondary outcomes included hemostatic efficacy, hospital and ICU length of stay (LOS), 30-day all-cause mortality, and discharge anticoagulant status. Statistical analysis is in progress.

Results:
A total of 174 patients were included, 97 in 4FPCC group, and 77 in a4FPCC group. All data presented are for 4FPCC and a4FPCC, respectively and have not been analyzed for significance. The majority of patients had a history of thromboembolism (67%, 63.6%), received apixaban (77.3%, 58.4%), and were taking anticoagulation for stroke prevention in atrial fibrillation (71.1%, 71.4%). The most common hemorrhage location was intracranial (55.8%, 44.2%), followed by gastrointestinal (26.7%, 22.1%), and pericardial (3.5%, 6.5%). Thirty-day post-reversal thromboembolism occurred in 17.5% and 11.7% of patients. The median ICU LOS was 5.1 and 2.6 days; hospital LOS was 10.7 and 6.3 days; 30-day all-cause mortality was 20.6 and 27.3%. Anticoagulant was resumed at discharge in 52.4% and 35.5%.

Conclusions:
Conclusions are to be presented at OPRC.

The Effect of Tirzepatide on Renal Outcomes, an Equivalency Study

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Learning Objectives:

1. Recall the influence of glucagon-like peptide-1 receptor agonists (GLP-1 RA) on chronic kidney disease (CKD)
2. Discuss the place of tirzepatide in the management of diabetes in patients with CKD

Purpose:

Some glucagon-like peptide-1 receptor agonists (GLP-1 RAs) have shown to improve renal outcomes through a variety of potential mechanisms. Tirzepatide is a novel medication that reduces blood sugar through simultaneous gastric inhibitory polypeptide (GIP) and GLP-1 receptor agonism. Given its similar mechanism of action to GLP-1 RAs, tirzepatide may also offer renal protection in patients with type 2 diabetes mellitus (T2DM). A post hoc analysis of SURPASS-4 showed improved kidney benefit; however, further research needs to be conducted to confirm these findings. This is an equivalency study between tirzepatide and GLP-1 Ras. The purpose of this study is to further explore the effect tirzepatide has on patient renal outcomes.

Methods:

Data was retrieved via retrospective chart review on adult patients with T2DM that have been on a GLP-1 RA or tirzepatide for 8 months since release of the GLP-1 RAs in 2017. Adherence was assessed via pharmacy fill history according to SureScripts on the patient's EMR. A list of potentially eligible patients was retrieved from the health system's EMR. Information on a patient's serum creatinine (SCr), estimated glomerular filtration rate (eGFR), and microalbumin/creatine (MALB/Scr) ratio were retrieved. The primary endpoint included changes in SCr, incidence of macroalbuminuria and worsening eGFR. Secondary outcomes included new incidence of microalbuminuria, reaching Stage 4 CKD, or ESRD requiring dialysis. Data was analyzed by two one-sided T test (TOST) and hazard ratio (HR).

Results:

The study included 127 total patients, with 100 taking a GLP-1 RA and 27 taking tirzepatide. More patients reached the primary endpoint on a GLP-1 RA than with tirzepatide (2 vs 0). HR was 0. There was no significant difference in SCr after treatment with tirzepatide vs GLP-1 RA ($p = 0.6$).

Conclusions:

Tirzepatide does not show evidence of worsening CKD and may slow disease progression more than GLP-1 RAs.

Evaluation of antimicrobial stewardship intervention impact on prescribing patterns in asymptomatic bacteriuria

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Learning Objectives:

1. Explain the harm of unnecessary treatment of asymptomatic bacteriuria (ASB).
2. Describe the difference between ASB and urinary tract infection (UTI).

Purpose:
Determine whether an antimicrobial stewardship intervention had an impact on prescribing patterns in ASB.

Methods:
This is a retrospective institutional review board (IRB) approved pre-post study evaluating antimicrobial stewardship intervention impact on prescribing patterns in ASB. The control phase included patients from January 1, 2023 through June 30, 2023 and the post-intervention phase included patients from December 5, 2023 through December 25, 2023. In the pre and post intervention phase, electronic medical records of patients with positive urine cultures and at least one hospital administered antibiotic dose were retrospectively reviewed. Patients were classified as having ASB or UTI based on Michigan Hospital Medicine Safety Consortium (HMS) criteria documented in the medical record. The intervention was a written report of the frequency and characteristics of ASB treatment coupled with education regarding guideline recommendations for management of ASB. The intervention was targeted towards emergency department, internal medicine, and family medicine providers. The post-intervention period started one week after the intervention occurred to assess the impact.

Results:
A total of 213 patients were included in the study, 106 in the pre-intervention group and 107 in the post-intervention group. Baseline characteristics between groups were similar. Among these, ASB was present in 19 patients (18%) and 24 patients (22%) respectively (P = 0.413).

Conclusions:
The antimicrobial stewardship intervention did not impact ASB treatment. Additional methods to reduce treatment of ASB need to be explored.

Impact of Lower Dose Intravenous Iron Replacement on Hospital Readmission and Mortality in Heart Failure Patients with Iron Deficiency

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Learning Objectives:

1. Identify patients who could be eligible for IV iron replacement
2. Evaluate literature regarding IV iron dosing in patients with heart failure
3. Address the benefits of IV iron based on the dose received

Purpose:
Iron deficiency (ID) is a common comorbidity of heart failure (HF) patients and manifests with similar symptoms, such as shortness of breath and exercise intolerance. Literature shows that intravenous (IV) iron replacement in patients with ID improves symptoms and reduces HF hospitalizations and mortality. The usual dosing strategy is at least 1 gram of IV iron, though evidence is lacking regarding the optimal dose in the inpatient setting. Many patients are discharged prior to receiving the full 1 gram of IV iron, so this study aims to detect if lower doses maintain benefit.

Methods:
This institutional review board-approved, retrospective cohort study evaluated patients with a history of HF, who received at least 1 dose of inpatient IV iron sucrose, and met criteria for ID with serum ferritin <100 mcg/L or serum ferritin 100-299 mcg/L and transferrin saturation <20%. Patients were excluded if they had an active gastrointestinal bleed, were on hemodialysis, received blood transfusions, or received IV iron replacement within 2 weeks. Patients were divided into groups based on whether they received <1 gram of IV iron sucrose or ≥1 gram IV iron sucrose. The primary outcome was a composite of HF hospitalization or mortality within 6 months. Secondary outcomes included the individual components of the primary outcome, number of HF readmissions within 6 months, 30-day HF readmission, and resolution of iron deficiency. All outcomes were analyzed using a Chi-square test, Mann-Whitney U test, or the two-sample t test, as appropriate.

Results:
Of the patients that were included, 91 and 51 were treated with <1 gram and ≥1 gram IV iron, respectively. Baseline demographics were similar between groups except those who received ≥1 gram IV iron had a lower Hgb and had a greater severity of illness, which was characterized by significantly more NYHA functional class IV patients, inotrope requirements, and longer length of stay. The primary outcome for the <1 gram IV iron group was 39 (42.9%) vs. 14 (29.4%) for the ≥1 gram IV iron group (p=0.069). There were no statistically significant differences in secondary outcomes or subgroup analyses.

Conclusion:
In patients who were treated with <1 gram of IV iron sucrose, there was no significant difference in HF hospitalization or mortality compared to those treated with ≥1 gram of IV iron sucrose.

Real World Experience with Inclisiran in an Academic Medical Center

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Learning Objectives:

1. Review the current evidence for treating hyperlipidemia with inclisiran
2. Summarize the safety and efficacy of inclisiran

Purpose:

Inclisiran (Leqvio) is a small interfering RNA agent (siRNA) against the PCSK9 enzyme and is the first lipid lowering medication with this unique mechanism of action. While approved in December 2021, inclisiran was not widely available until the spring of 2022. The majority of data is based on the landmark approval ORION studies. Although a post-hoc safety analysis of these trials was recently published, there is only one trial looking at the real-world use of inclisiran with data limited to patients receiving a single dose during the study timeframe. Given limited reported real-world experience with the use of inclisiran, the purpose is to fill the gaps in the literature both with a broader patient population and with a longer follow up time than previously reviewed.

Methods:

This is a retrospective analysis of patients at The Ohio State University Wexner Medical Center (OSUWMC) Cardiovascular Risk Reduction and Lipid Clinics ("Lipid Clinic"). The standard of practice in the Lipid Clinic is for inclisiran to be administered at an infusion suite. Included patients received at least one dose of inclisiran between April 1, 2022 and October 31, 2023 at OSUWMC. Two coprimary efficacy outcomes assessed: percentage of patients achieving at least a 50% LDL lowering from baseline, and percentage of patients achieving their individualized LDL target. The primary safety outcome is the incidence of adverse drug events. Secondary outcomes include the overall percent lowering of LDL from baseline, the rate of drug discontinuation, and the percent of patients prescribed inclisiran but not receiving any doses. Several subgroup analyses will be performed.

Results:

Data collection is currently in progress, with full results expected by April 2024. On initial review, 38 patients received inclisiran during the 19-month period. A total of 81 doses of inclisiran were administered as 12 (31.6%) patients received 1 dose, 11 (28.9%) received 2 doses, 13 (34.2%) received 3 doses, and 2 (5.3%) received 4 doses. Adverse drug events occurred in 6 (15.8%) patients, with 3 (7.9%) of the safety events leading to drug discontinuation. An additional 3 (7.9%) patients discontinued inclisiran due to patient preference of switching to an alternative medication.

Conclusion:

Initial review demonstrates that inclisiran is safe for continued use beyond a single dose. The overall efficacy will be established when data collection is complete. Final results will be presented at the conference.

Factor-Xa Inhibitor Reversal Decisions in Confirmed Intracranial Hemorrhage with Elevated Prothrombin Time in the Absence of On-Site Low Molecular Weight Heparin Anti-Factor-Xa Testing

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Learning Objectives:

1. Describe the relationship between prothrombin time, low molecular weight heparin-calibrated anti-factor-Xa levels, and factor-Xa inhibitor concentrations.
2. Discuss the clinical impact of a lack of on-site low molecular weight heparin-calibrated anti-factor-Xa testing on decisions regarding factor-Xa inhibitor reversal in patients with intracranial hemorrhage.

Purpose:
Prothrombin time (PT) and factor-Xa inhibitor concentrations are known to poorly correlate, while low molecular weight heparin-calibrated anti-factor-Xa levels (LMWH-anti-Xa) correlate well with factor-Xa inhibitor concentrations. On-site LMWH-anti-Xa are unavailable at many community hospitals, including this institution with level III trauma center and primary stroke center designations. This study compares PT and LMWH-anti-Xa while investigating appropriate decision-making related to factor-Xa inhibitor reversal in the absence of on-site LMWH-anti-Xa testing.

Methods:
This IRB-approved, retrospective cohort looked at patients taking a factor-Xa inhibitor with confirmed intracranial hemorrhage (ICH) with a PT and LMWH-anti-Xa drawn during the emergency department (ED) encounter between August 1, 2020 and June 30, 2023. Patients were separated into groups based on a PT > 16 seconds (s) and ≤ 16 s. The primary outcome was the incidence of LMWH-anti-Xa > 0.5 units/mL. Select secondary outcomes included incidence of appropriate anticoagulation reversal per protocol and per LMWH-anti-Xa, and incidence of delayed reversal.

Results:
Of the 705 patients with confirmed ICH, 25 patients met inclusion criteria with a PT and a LMWH-anti-Xa drawn during the ED encounter: 13 with a PT > 16 s and 12 with a PT ≤ 16 s. A statistically significant difference in LMWH-anti-Xa > 0.5 units/mL was not found between the two groups (92.3% vs. 91.7%, respectively; p = 1.000). There was no statistically significant difference between groups regarding appropriate reversal decisions per protocol or per LMWH-anti-Xa nor delayed reversal of anticoagulation.

Conclusions:
This study did not show a statistically significant difference in LMWH-anti-Xa > 0.5 units/mL between patients with a PT > 16 s and a PT ≤ 16 s. This demonstrates the unreliability of a PT to determine the anticoagulation status of a patient taking a factor-Xa inhibitor. On-site LMWH-anti-Xa testing could be beneficial to ensure appropriate anticoagulation reversal decisions in ICH.

Clinical Utility of Nasal Methicillin-Resistant Staphylococcus Aureus Polymerase Chain Reaction in Patients with Diabetic Foot Infections

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Learning Objectives:

1. Describe risk factors for MRSA isolation from diabetic foot infections
2. Describe risks of unnecessary antibiotic coverage
3. Discuss the potential utility of nasal MRSA PCR screening for patients with diabetic foot infections

Purpose:
Nasal methicillin-resistant Staphylococcus aureus (MRSA) polymerase chain reaction (PCR) screening has been widely studied as a tool to aid in the de-escalation of antibiotics in pneumonia. Currently, there is limited data to support the use of nasal MRSA PCR screening in other types of infections. This study sought to determine the clinical utility of nasal MRSA PCR in diabetic foot infections (DFIs).

Methods:
This was a retrospective chart review from a multi-hospital health system. The primary outcome was the positive predictive value (PPV), negative predictive value (NPV), sensitivity, and specificity of nasal MRSA PCR screening for DFIs. Patients were required to have a DFI diagnosis during hospitalization, have a finalized nasal MRSA PCR during admission, and have finalized culture results within 7 days of the MRSA PCR. Nasal MRSA PCR results were paired with culture results to determine the primary outcome.

Results:
307 patient admissions were reviewed with 282 meeting inclusion criteria. For the primary outcome, the PPV of nasal MRSA PCR in DFIs was 74% and NPV was 82.8%. Sensitivity and specificity were 48.1% and 93.7%, respectively.

Conclusion:
In this patient population, the NPV risks inappropriate antibiotic de-escalation in over 17% of patients, limiting the clinical utility of nasal MRSA PCR in DFIs.

Diagnosis codes included on prescriptions transmitted to chain community pharmacies: a retrospective analysis

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Learning Objectives:

1. Discuss whether diagnosis codes are required to be documented on prescriptions by prescribers, based on state and federal regulations.
2. Review the literature surrounding the impact of pharmacist access to pertinent patient data on drug utilization review.

Purpose:

Including diagnosis (Dx) codes on prescriptions sent to community pharmacies can be one of the easiest and most efficient ways prescribers can communicate patients' specific disease states to pharmacists. A gap in the literature exists about assessing what factors (outside of state/federal regulations) impact the probability that Dx codes are recorded on electronic prescriptions (E-Rxs) sent to pharmacies. The primary objective of this study is to determine the proportion of E-Rxs sent to a midwestern-based chain pharmacy that contain a Dx code(s). The secondary objective is to identify factors that impact whether a Dx code(s) is (are) recorded on E-Rxs sent to the chain pharmacy.

Methods:

This was a retrospective prescription record review of E-Rxs received by Meijer pharmacies between June 1st, 2022, and December 31st, 2023. The dependent variable in the study was the presence or absence of a Dx code(s) documented on each E-Rx and the independent variables were patient age and sex, drug legend and therapeutic class, day supply and refills authorized, prescriber type and location, and pharmacy location. Data was manually extracted from the pharmacy software system into a Microsoft Excel file. The data will be analyzed using descriptive and inferential statistics. Excluded from the study were refilled prescriptions and prescriptions manually added after transmission to the pharmacies.

Results:

Over 35 million E-Rxs analyzed, 54.45% had a Dx code(s) present upon transmission to the pharmacy. The highest proportions of E-Rxs with Dx codes were by Dx code: I10, hypertension, (5.55%), by legend: schedule IV (61.52%), by therapeutic class: dermatological drugs (60.73%), by day supply: 90 (57.76%), by refills: 12+ or PRN (59.49%), by pharmacy location: New York (60.39%), and by prescriber location: North Dakota (80.9%).

Conclusions:

Conclusions will be presented at the 2024 Ohio Pharmacy Residency Conference. Logistic regression analysis will help to identify factors the probability that Dx codes recorded on E-Rxs sent to pharmacies.

Comparing the Safety and Efficacy of the Utilization of SMOF vs Intralipid in the Neonatal Population

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Learning Objectives:

1. Describe various indications as well as risks of utilizing total parenteral nutrition
2. Review various injectable lipid emulsions indicated for pediatric use
3. Evaluate current recommendations for neonatal injectable lipid emulsion use

Purpose:

Total parenteral nutrition (TPN) may be utilized for a multitude of reasons in NICU patients. It provides essential nutrients and calories to support growth and development. The aim of this study is to investigate and provide better guidance on the utilization of injectable lipid emulsions (ILEs) in the neonatal population. There is historical data to support the idea that a more diverse lipid profile, such as SMOF lipids, has less harmful impact on the liver, resulting in fewer patients developing cholestasis.

Methods:

This study is a single-center retrospective chart review conducted for NICU patients at Children's Hospital of Michigan with the ICD code for TPN between January 1st, 2020, and January 1st, 2023. The data collected will be stratified according to whether or not the ILE type changed during admission and the length of ILE use. Pertinent vitals and labs were analyzed as well. The primary outcome observed is weight gain over time, an efficacy endpoint. The secondary outcome evaluated is whether or not patients developed peripheral nutrition-associated cholestasis (PNAC), a safety endpoint. This data will be utilized to update Children's Hospital of Michigan neonatal TPN guidelines.

Results:

Results of this study will be presented at the 2024 Ohio Pharmacy Residency Conference.

Conclusion:

Discussion of results will be presented at the 2024 Ohio Pharmacy Residency Conference.

Low Molecular Weight Heparin Monitoring in Pregnant Patients

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Learning Objectives:

1. Describe current national association guidance for the use of low molecular weight heparin in pregnant patients.
2. Analyze available evidence regarding the monitoring of low molecular weight heparin in pregnant patients.

Purpose:

Low-molecular weight heparin (LMWH) is recommended first-line for pregnant women with thrombotic conditions. However, since the distribution and clearance of LMWH in pregnancy is not well-established, anti-Xa level monitoring is often performed to ensure appropriate concentrations. Gaps in evidence exist regarding the utility, frequency, and timing of anti-Xa monitoring, as well as a correlation between anti-Xa monitoring and clinical events. The proposed study aims to examine these questions by characterizing current practice at OSUWMC and the outcomes of the patients accordingly.

Methods:

This will be a retrospective analysis of patients at The OSUWMC who were pregnant and prescribed at least 30 days of LMWH between January 1, 2018 and December 31, 2022. The patient groups will be those who were monitored with anti-Xa levels and those who were not monitored. The primary outcome will be to characterize the patients among the different groups to determine the optimal utility, frequency, and timing of anti-Xa monitoring. The secondary outcomes are incidence thrombotic events during pregnancy and by six weeks post-partum; incidence of bleeding during pregnancy and at delivery; and incidence of miscarriage or preterm birth.

Patient characteristics that will be collected are age, race, weight, body mass index; history of cardiovascular disease, thrombophilia, preeclampsia; pregnancy parity, gravidity; alcohol use, smoking status, family history, prior thrombosis, prior bleeding, concomitant antiplatelets and non-steroidal anti-inflammatory drugs; anticoagulation indication, target anti-Xa range, LMWH doses, anti-Xa levels, creatinine clearance, hemoglobin and hematocrit, platelets, responsible provider service, thrombosis during pregnancy and six weeks post-partum, bleeding during pregnancy and at delivery, miscarriage and preterm birth.

Results:

The results will be presented at the Ohio Pharmacy Residency Conference

Conclusions:

The conclusions will be presented at the Ohio Pharmacy Residency Conference. The goal of this study is to use the data collected and analyzed to enhance the existing protocol for monitoring this patient population at our institution. The revised protocol may be shared with other institutions to improve the standard for best practices in this clinical area.

Serum magnesium associated with atrial fibrillation rates in cardiothoracic surgery (CTS)

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Learning Objectives:

1. Review current literature on magnesium effects on atrial fibrillation rate in patients who have undergone cardiothoracic surgery
2. Identify the effect varying magnesium levels have on atrial fibrillation in patients who have undergone cardiothoracic surgery within Harper University Hospital

Purpose:

The aim of this study is to assess the effect magnesium levels have on atrial fibrillation in patients who have undergone CTS. The primary outcome will be the incidence of atrial fibrillation within varying magnesium ranges (i.e., 1-1.5, 1.6-2, 2.1-2.5, >2.5). Subgroup analysis will be performed on the type of procedure and surgery. Secondary outcomes will include mortality rates, vasopressor use, and need for anti-arrhythmic medications.

Methods:

This will be a retrospective cohort study assessing optimal serum magnesium levels to reduce the risk of atrial fibrillation in post-operative CTS patients. Adult patients ages 18 and older admitted to Detroit Medical Center Harper University Hospital between December 29, 2019 to December 22, 2023 will be included. Additional inclusion criteria will be patients who have received coronary artery bypass grafting (CABG) and/or open valve replacements. Exclusion criteria will be patients with a history of atrial fibrillation and high-risk individuals such as pregnant patients, prisoners, or patients with cognitive delays. Patients will be identified using the Adult Cardiac Surgery Database. All data collected will be coded and maintained confidentially. Data collected will include demographics, inpatient and outpatient medications, incidence of atrial fibrillation, number of ventilator days, intensive care unit (ICU) days, vitals, and serum electrolytes. Descriptive statistics will be used for all variables as appropriate. Univariate analysis will be utilized to determine risk factors for atrial fibrillation in this population. Significant variables from univariate analysis will be included in a multivariate regression model which will include the varying magnesium levels as an a-priori outcome of interest.

Results:

Results will be presented at the 2024 Ohio Pharmacy Residency Conference.

Conclusions:

Results will be presented at the 2024 Ohio Pharmacy Residency Conference.

Discharge Opioid Prescribing Patterns for Opioid-Naïve Post-Surgical Patients at a Level III Community-Based Hospital

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Learning Objectives:

1. Recognize the 2018 Johns Hopkins opioid prescribing recommendations for opioid-naïve post-surgical patients.
2. Evaluate common opioid prescribing patterns for post-surgical patients at a level III community-based hospital.
3. Identify areas for intervention to improve opioid-prescribing for any post-surgical patient.

Purpose:

Opioid addiction and drug diversion are known issues relating to the medical field. Medical professionals are in a position to combat this epidemic. In 2018, Johns Hopkins published an article providing recommendations on prescribing opioids to opioid-naïve patients on discharge after select procedures. Using these recommendations provided by John Hopkins, Blanchard Valley Hospital (BVH) surgeons' opioid prescribing patterns will be evaluated. After a baseline is determined, education will be provided to surgeons on the guidance documents and prescribing patterns will be monitored for adjustments.

Methods:

This study was submitted to the Blanchard Valley Health System Institutional Review Board and the University of Findlay Institutional Review Board for approval. Patient charts were reviewed retrospectively for opioid prescribing at discharge for post-surgical patients via the electronic medical record. Inclusion criteria included patients admitted to BVH between July 1st, 2022 and July 1st, 2023 who underwent one of the surgeries discussed in the 2018 Johns Hopkins opioid prescribing document, length of stay of at least 48 hours, opioid-naïve, and age greater than or equal to 18 years. Exclusion criteria included patients with discharge scripts inaccessible using our electronic medical record. Collected data included age, surgery type, opioid usage 24 hours prior to discharge, prescribed opioids normalized to morphine equivalent dose, prescriber, and if the patient returned for uncontrolled pain related to the surgery within 10 days after discharge. The Ohio Automated Rx Reporting System (OARRS) was queried to evaluate if and when the opioid prescription was filled. Baseline data will be analyzed and presented to the surgeons, along with any additional educational material on opioid prescribing. Patients will then continue to be retrospectively reviewed in the same manner as with baseline data collection, concluding with any patient undergoing surgery before May 31, 2024.

Results:

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

Conclusions:

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

Cefdinir as Oral Step-Down Therapy in the Treatment of Urinary Tract Infections (UTI)

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Learning Objectives:

1. Illustrate the role of cephalosporins in urinary tract infections and pharmacokinetic parameters to consider prior to antibiotic selection
2. Assess the incidence of UTI recurrence following treatment with cefdinir in comparison to other agents

Purpose:

Urinary tract infections (UTI) are prevalent in the United States, with approximately 2.8 million UTI related hospital admissions in 2018. Oral cephalosporins are an intuitive de-escalation from intravenous beta-lactams due to their favorable cost and safety profile. Cefdinir is the only oral third-generation cephalosporin on formulary at our institution, however concerns have been raised regarding its efficacy in UTI given limited concentrations in urine. The objective of this study was to assess the clinical outcomes of cefdinir vs other oral cephalosporins in UTI.

Methods:

A retrospective chart review was conducted for patients admitted to Mount Carmel Health System with UTI between January - December 2023 and received an oral cephalosporin with appropriate coverage. The primary outcome was the rate of UTI recurrence with the same organism within 30 days of completing IV antibiotics followed by an oral cephalosporin. Secondary outcomes included development of resistance despite 3 days or more of intravenous therapy.

Results:

230 patients were included in the final study analysis with 113 in the cefdinir group and 117 in the other cephalosporin group. The rate of UTI recurrence with the same organism was 1/113 (0.9%) for cefdinir vs 9/117(7.7%) for other cephalosporins. Only 15 recurrent UTI patients had positive culture results available for analysis. Of these, 3/4 (75%) cefdinir patients and 5/11 (45%) other cephalosporin patients had developed resistance with either new resistance reported in the same organism or growth of a new, more resistance organism.

Conclusions:

Cefdinir was significantly better than other oral cephalosporins for the treatment of UTI after hospital admission at preventing recurrence within 30 days. Recurrence with more resistant organisms was higher for patients treated with cefdinir where culture results are available. This study indicates cefdinir is an appropriate antibiotic for UTI, however stewardship efforts are still important to consider other factors such as development of resistance.

Weight Loss Outcomes Associated with Semaglutide Treatment for Patients with Overweight or Obesity in a Rural Ambulatory Clinic

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UAN: 0048-0000-24-140-L01-P

Learning Objectives:

1. Report percent weight change for patients who receive semaglutide for weight loss for at least 3 months
2. Evaluate potential health benefits and improvement in laboratory markers associated with use of GLP-1s for weight loss

Purpose:

Injectable glucagon-like peptide receptor agonists (GLP-1 RAs) are medications that are FDA approved for both type 2 diabetes and weight management with additional health benefits, including reduction of major adverse cardiovascular events (MACE). GLP-1 RAs remain one of the most widely used classes of medications for weight loss, with semaglutide demonstrating superior reduction in weight when compared to liraglutide. This study expands on populations previously studied in clinical trials and observational studies to include those with a history of bariatric surgery and/or patients taking more than one anti-obesity medication. The purpose of this study is to determine percent weight loss and evaluate additional health outcomes associated with semaglutide treatment in a rural ambulatory clinic setting.

Methods:

This retrospective review was conducted at the Firelands Center for Coordinated Care at Firelands Regional Medical Center. 1,612 patient charts were reviewed from June 2021 through July 2023 for overweight or obese patients who have been prescribed the GLP-1 agonist semaglutide for a minimum of 3 months. Exclusion criteria includes patients under the age of 18 and patients with diabetes who are considered insulin-dependent. Metrics regarding the patient's weight loss progress and clinical data that may indicate an improvement in co-morbidities were obtained from the chart, assessed, and categorized. The primary outcome was percent change in body weight from baseline. Secondary outcomes included change in waist circumference, percent weight loss by obesity category, percent weight loss by A1C category, change in A1C (for those with co-morbid prediabetes or diabetes); and percent weight loss by semaglutide dose received.

Results:

Results from this study will be presented at the Ohio Pharmacy Residency Conference in May 2024.

Conclusions:

Conclusions from this study will be presented at the Ohio Pharmacy Residency Conference in May 2024.

Incidence of adverse events with the use of GLP-1 agonists for type 2 diabetes mellites versus other indications

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Learning Objectives:

1. Describe the current use of GLP-1 receptor agonists in the setting of type 2 diabetes and other indications
2. Review the adverse effects caused by GLP-1 agonists used for the indication of type 2 diabetes mellitus versus other indications.

Purpose:

Glucagon-like peptide-1 (GLP-1s) and glucose-dependent insulinotropic polypeptides (GIPs) are incretin hormones that stimulate the secretion of insulin after oral intake of glucose. In type 2 diabetes, this mechanism is altered and medications that work on the GLP-1 receptor and GIPs help to restore this process. These medications also delay gastric emptying, causing increased satiety leading to decreased caloric intake and weight loss. They also inhibit the pancreatic alpha cells from producing glucagon and the apoptosis of pancreatic beta cells. The most common adverse effects seen include nausea, vomiting, and diarrhea, especially when starting therapy or increasing doses. Other adverse events include constipation, abdominal pain, and pancreatitis. Previous studies investigated the rate in which GI events occur between GLP-1 agonists and dose adjustments. The purpose of our study is to investigate the incidence of gastrointestinal adverse events of GLP-1 agonists and GLP-1 agonist/GIP for type 2 diabetes compared to other uses and subsequent modifications to therapy.

Methods:

This retrospective cohort study completed at the University of Toledo Medical Center between October 1, 2022, and August 1, 2023, included patients on agents that affect GLP-1 receptors. Patients were included if they were at least 18 years old, a patient of UTMC Family Medicine clinic, and on a GLP-1 receptor agonist. Patients were excluded if they were pregnant, had a history of pancreatitis, or history of GI disturbances. The primary endpoint was to compare the incidence of GI disturbance and pancreatitis between diabetes and non-diabetes indications. GI disturbance was defined as diarrhea, constipation, vomiting, nausea, and abdominal pain. The secondary endpoint was the addressing of therapy upon follow-up, which included change in dosing or holding or stopping the medication.

Results:

Results will be presented at the Ohio Pharmacy Resident Conference.

Conclusion:

Conclusions will be presented at the Ohio Pharmacy Resident Conference.

Pharmacist-Led Pain Management Interventions in the Critically Ill

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UAN: 0048-0000-24-142-L08-P

Learning Objectives:

1. Identify the most common pharmacist-recommended pain management interventions in the Intensive Care Unit.
2. Describe the effectiveness of pharmacist efforts to improve pain control based on the overall proportion of ICU patients with an optimization implemented.

Purpose:
Intermittent intravenous (IV) opioids are frequently used in the intensive care unit (ICU) due to their relative efficacy and quick onset of action. Other guideline-supported pain management strategies are often underutilized despite improving patient-centered outcomes because many institutions do not have a dedicated interdisciplinary pain management service. This study describes the most common optimization opportunities identified by the pharmacist and the acceptance rates of their recommendations by the ICU providers.

Methods:
Adult ICU patients with an active opioid order or numeric pain score greater than 3 (scale 0-10) were reviewed using a standardized evaluation form. The primary outcome was the relative frequency of each intervention type recommended. Secondary outcomes included the acceptance rates of each category, mean number of recommendations per regimen assessed, and mean number of accepted interventions per regimen assessed.

Results:
Ninety-one ICU regimens were evaluated between September 14, 2023 and December 22, 2023. The most common recommendation category was adding a non-opioid analgesic, with acetaminophen making up 51.9% (28/54), neuropathic agents 3.7% (2/54), and NSAIDs 1.9% (1/54) of recommendations. Optimization of the existing regimens had more variability, with changing IV to oral route accounting for 18.5% (10/54), followed by opioid discontinuation, opioid initiation, and adjusting the dose or frequency (9.3% [5/54], 5.6% [3/54], 5.6% [3/54], respectively). The overall acceptance rate of pharmacist recommendations was 70.4% (38/54). Within each category, 76.2% (16/21) of current regimen optimizations, 67.7% (21/31) of adjunctive analgesic additions, and 50% (1/2) of supportive agent recommendations were accepted.

Conclusions:
Multimodal analgesia using adjunctive, non-opioid analgesics was the most common pain management optimization identified in adult ICU regimens. This study demonstrates that pharmacists can effectively contribute to improving pain management regimens for patients in the ICU.

Evaluation of Post-Intubation Sedation Following Rocuronium Versus Succinylcholine in the Emergency Department

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UAN: 0048-0000-24-143-L01-P

Learning Objectives:

1. Describe the differences in time to post-intubation sedation and sedative dosing between patients administered rocuronium and succinylcholine during rapid sequence intubation in the emergency department.
2. Analyze the potential implications of delayed initiation and inadequate maintenance of sedation following rapid sequence intubation, particularly in patients administered rocuronium, on patient outcomes.

Purpose:

Succinylcholine and rocuronium are commonly utilized neuromuscular blocking agents in rapid sequence intubation (RSI) within emergency department settings. However, rocuronium exhibits a substantially prolonged duration of action compared to succinylcholine (60 minutes versus 10 minutes) when administered at intubating doses. Previous research has indicated that the use of rocuronium is correlated with increased delays in the onset of sedation and instances of inadequate sedation post intubation. This study aims to evaluate the difference in the time required to initiate sedation and variations in sedation dosages subsequent to intubation with either rocuronium or succinylcholine within the emergency department context.

Methods:

This retrospective, multi-center study involved reviewing the medical charts of adult patients aged 18 years or older who presented at either Sinai-Grace or Detroit Receiving Hospital between July 1st, 2021, and July 31st, 2023. Inclusion criteria required patients to have received either rocuronium or succinylcholine during rapid sequence intubation in the emergency department and to have been administered at least one dose of a sedative agent post-intubation. Exclusion criteria encompassed patients under 18 years of age, pregnant individuals, or those incarcerated, as well as patients intubated prior to emergency department admission, those experiencing cardiac arrest before or during their emergency department visit, or individuals receiving sugammadex reversal within 60 minutes of rocuronium administration. Patients were categorized based on the paralysis agent administered—rocuronium or succinylcholine. Primary outcomes assessed included the time taken to initiate sedation and sedation dosing at 30-minute intervals up to two hours post-intubation between the two groups. Secondary outcomes included the need for a second sedative infusion to achieve optimal sedation, bolus administration for post-intubation sedation, incidence of post-intubation tachycardia episodes, duration of mechanical ventilation, and length of stay in the intensive care unit and hospital.

Results:

Ongoing research findings are currently being compiled and will be presented at the 2024 Ohio Pharmacy Residency Conference.

Conclusions:

The finalization of the conclusion is currently underway and will be shared at the 2024 Ohio Pharmacy Residency Conference.

Pharmacist Involvement in Rapid Sequence Intubation: How We Can Help

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Catherine Wilson, PharmD

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Learning Objectives:

1. Discuss the impact of having a pharmacist present during RSI in the ED
2. Identify pharmacokinetic differences between rocuronium and succinylcholine

Purpose:

Previous studies have shown that clinical pharmacist involvement in rapid sequence intubation (RSI) in the emergency department (ED), provides significant benefit in time to the patient receiving post-intubation sedation and analgesia. Sedation and analgesia post-intubation are important components of RSI that can sometimes be missed and potentially cause severe psychological and physical damage to paralyzed patients. At University Hospitals (UH) Parma Medical Center, we have not yet looked at the potential issue of not properly sedating or providing analgesia to patients post-RSI in the ED. We aim to see a benefit from the involvement of a clinical pharmacist in RSI with both time to sedation and analgesia post-intubation in the ED at UH Parma Medical Center.

Methods:

Data was collected through retrospective chart review. This was a single-center, pre-post cohort study from September 1st, 2022 – August 31st, 2023. The presence of a clinical pharmacy specialist during RSI was analyzed as the predictor variable. The primary objective was to determine if there is a difference in time to sedation post-RSI in the ED with a clinical pharmacist present vs. without a pharmacist present. The secondary objectives include difference in time to analgesia, difference in time to sedation or analgesia when rocuronium is used as the paralytic vs. succinylcholine, difference in intensive care unit length of stay (ICU LOS), and incidence of ICU delirium with a pharmacist present vs. without a pharmacist. Continuous variables were compared using Student's T-test while categorical variables were compared using a chi-square analysis.

Results:

The primary outcome of average time to sedation between pharmacist present cohort vs. not present cohort and rocuronium vs. succinylcholine, demonstrated no statistically significant difference, $t = 1.52$ ($p = .0674$) and $t = 1.71$ ($p = .0977$) respectively. The secondary outcome of difference in time to analgesia was analyzed using the student's T-test in the rocuronium and succinylcholine group respectively with no statistical significance seen, $t = 0.82$ ($p = 0.4181$); $t = 0.74$ ($p = 0.47$). All other statistical analyses for the remaining secondary outcomes were analyzed using the Chi-square test of independence with the degrees of freedom set to 1 with a significance level of 0.05. Secondary outcomes of difference in ICU LOS, difference in rates of ICU delirium, and difference between time to sedation or analgesia when rocuronium is used vs. succinylcholine had no statistically significant results.

Conclusions:

While neither the primary outcome nor any of the secondary outcomes analyzed showed any statistically significant differences, there were potentially significant clinical findings made throughout this study. One particularly notable finding included a tendency to leave patients who were paralyzed with rocuronium without sedation longer than patients who received succinylcholine. Further studies with a larger patient population may be more effective to appropriately evaluate this process.

Exploring pharmacists' perceptions of AI language processing tools in precepting

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Learning Objectives:

1. Explain pharmacists' perception of artificial intelligence in pharmacy education
2. Identify key concerns and training needs
3. Explore the potential of artificial intelligence in enhancing pharmacy education

Purpose:
The advent and evolution of artificial intelligence technology has led to its incorporation into various domains, including healthcare and education. Artificial intelligence, particularly text-based language processing systems, offers the potential for enhancing the learning experience, facilitating more personalized interactions, and improving the overall efficiency in healthcare education. Understanding the perception of pharmacists who precept residents and students towards these technologies is vital to understanding of potential advantages, challenges, readiness, and concerns surrounding this technology's application in pharmacy education.

Methods:
We conducted a cross-sectional survey among pharmacists with experience in precepting, gathering responses from 830 participants to assess their experience, familiarity with artificial intelligence technologies, and perceptions regarding the application of artificial intelligence tools in educational settings. The survey aimed to highlight areas requiring focused training and address prevalent concerns among educators. It was distributed via forums on Vizient and ASHP, and listservs obtained from the Ohio and Florida Boards of Pharmacy.

Results:
Of the 830 respondents, 446 had recent precepting experience. A significant interest in artificial intelligence tool utilization was observed, with a consensus on the necessity for basic training. Concerns were predominantly about the accuracy of artificial intelligence-generated content, potential erosion of human interaction, and issues surrounding data privacy. 78.8% of participants preferred an artificial intelligence-generated abstract over a human written one in a comparative analysis, indicating a favorable perception of artificial intelligence's effectiveness in content generation. Engagement spanned across diverse levels of professional experience, suggesting widespread curiosity and readiness to embrace artificial intelligence.

Conclusions:
The findings highlight the positive outlook on the incorporation of artificial intelligence in pharmacy education, coupled with a clear demand for structured training programs. Addressing identified concerns is crucial for harnessing artificial intelligence's full potential. As pharmacy education continues to evolve, equipping preceptors with the necessary skills to integrate artificial intelligence effectively will ensure that the future workforce is prepared for a technologically advanced healthcare landscape.

Impact of Pharmacy Technicians Utilizing Immunization Information Systems (IIS) in a Large Community Pharmacy Chain on Vaccine Administration Rates

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Learning Objectives:

1. Identify how IISs can be an important tool in community pharmacies.
2. Discuss implementation of granting technicians access to the statewide IIS.
3. Describe the role of IISs in making vaccine recommendations.

Purpose:

The primary objective of this study is to compare the impact of pharmacy technician IIS access and engagement on vaccinations administered at intervention pharmacies compared to control pharmacies. The secondary objectives are to (1) evaluate the appropriateness of vaccinations administered at intervention and control pharmacies by auditing state IISs and local pharmacy records of a randomly selected sample of vaccines administered during the study period and to (2) evaluate change in pharmacy personnel knowledge, confidence, and competence utilizing the statewide IIS.

Methods:

This study was approved by the University of Cincinnati Institutional Review Board. The study was conducted in 10-20 pharmacies within one division of a large community pharmacy chain. Pharmacies involved in this study were designated as control or intervention pharmacies. The intervention pharmacies received training on utilizing IIS reports and technicians were granted account access to the IIS. Pharmacy technicians accessed and retrieved a patients' immunization information report as part of a new standardized vaccine process. First, technicians retrieved an immunization information report if a patient scheduled a vaccination appointment online. Second, the technician identified common medications, for diabetes and respiratory conditions, that were ready in will call from a targeted medication list to target vaccines. The immunization information report was delivered to the pharmacist, who placed a mandatory counseling note on the patient's profile prompting pharmacy personnel to recommend appropriate vaccines to the patient at the point-of-sale. A Mann-Whitney U test will be used to compare vaccine rates between the intervention and control pharmacies. All pharmacy staff completed a survey pre implementation evaluating knowledge, confidence, and competence of statewide IIS and will complete the same survey post implementation. Responses to the surveys were evaluated using a five-point Likert scale.

Results:

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

Conclusions:

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

The Impact of Default Low-Dose Ketorolac in the Emergency Department

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Learning Objectives:

1. Review the role of ketorolac in acute pain and potential consequences of the analgesic ceiling.
2. Identify if a default dosing algorithm results in increased ordering of low-dose ketorolac.
3. Discuss the implications of ketorolac 15 mg versus 30 mg on acute pain and time to discharge.

Purpose:
Ketorolac is a nonsteroidal anti-inflammatory drug that is proposed to exhibit an analgesic ceiling, with potential increased risk of harm and no additional therapeutic benefit above the ceiling dose. Studies have suggested that doses of 10-15 mg provide sufficient, similar analgesic effect compared to higher doses (30 mg or greater) for acute pain. In 2022, MetroHealth Emergency Department (ED) implemented an initiative to adjust default intravenous (IV) ketorolac dosing from 30 mg to 15 mg (low-dose). The order modification served as the foundation of this study.

Methods:
This was a retrospective pre-post study of patients presenting to the ED for acute pain from July 1, 2021 to January 31, 2022 (pre-modification of dosing default) and February 1, 2022 to July 31, 2022 (post-modification). Patients included received at least one dose of IV ketorolac for the management of acute pain and had a baseline numeric pain score reported. Patients were screened, then randomized within each group via random number generator. The primary outcome assessed if default dose modification preference to low-dose ketorolac resulted in an increased ordering pattern compared to higher-dose ketorolac. Secondary outcomes included assessment of post-ketorolac pain scores, repeat analgesia, and time to ED discharge. Univariate analyses were used to assess associations of categorical, demographic, and clinical covariates between groups.

Results:
A total of 200 patients were included; 101 in the pre-modification group, 99 in the post-modification group. Low-dose ketorolac was used in 65 (64%) patients in the pre-modification group compared to 95 (96%) in the post-modification group ($p<0.001$). No significant differences were found between groups regarding post-ketorolac pain score ($p=0.91$), repeat analgesia ($p=0.84$), and time to ED discharge ($p=0.81$).

Conclusions:
This study demonstrated that an EMR default dose modification resulted in increased provider ordering of low-dose ketorolac in the ED.

Comparison of Vancomycin Therapy Utilizing Bayesian-Estimated Area Under the Curve Dosing Versus Trough-Based Dosing

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Learning Objectives:

1. Explain the rationale behind transitioning from trough-based dosing to Bayesian-estimated AUC dosing for IV vancomycin.
2. Assess therapeutic target attainment for IV vancomycin with trough-based dosing versus Bayesian-estimated AUC dosing.
3. Utilize the current study to assess the facility's process for dosing IV vancomycin.

Purpose:

Intravenous (IV) vancomycin requires frequent monitoring to avoid potential nephrotoxicity and ensure optimal therapy. The Infectious Disease Society of America (IDSA) recommended the switch from trough-based dosing to area under the curve/minimum inhibitory concentration (MIC/AUC)-based dosing. Using Bayesian software was later recommended to improve therapeutic target attainment and reduce rates of acute kidney injury (AKI). This study is intended to analyze our target level attainment and incidence of AKI while utilizing Bayesian-estimated AUC dosing (InsightRx) versus trough-based dosing at Mercy Health St. Rita's Medical Center (SRMC).

Methods:

This was a single center, retrospective chart review of inpatient medical records. Patients that were dosed with IV vancomycin using trough-based dosing were analyzed from January 2019 to December of 2020. Bayesian-AUC estimations were assessed for these patients using InsightRx. Patients included in the Bayesian-estimated AUC group were analyzed from January of 2021 to December of 2022. Inclusion criteria included patients 18 years of age and older, received at least 72 hours of IV vancomycin, and had at least one appropriately drawn vancomycin level obtained for monitoring during the original regimen. Exclusion criteria included those with AKI on admission, CrCl less than 30 mL/min on admission, any renal replacement therapy, those with a BMI less than 18.5 kg/m^2, upper or lower extremity amputations, quadriplegia/paraplegia, an ICU admission at any point of their vancomycin therapy, and utilization of an alternative vancomycin dosing strategy. The primary outcome of this study is the percentage of AUC values within a Bayesian-estimated AUC/MIC of 400-600 mg*h/L between an AUC-based dosing strategy group versus a trough-based group when dosing IV vancomycin. The AUC estimate will be based on the first level drawn within the original regimen. Secondary outcomes include the incidence of AKI, total daily dose (TDD) of IV vancomycin, number of vancomycin levels drawn, and the number of dosage adjustments over the total duration of therapy. A subgroup analysis will be conducted to analyze primary and secondary endpoints in patients with a BMI ≤ 30kg/m^2 versus a BMI > 30 kg/m^2.

Results:

Final results to be presented, data is currently under analysis.

Conclusions:

Final conclusions to be presented at the Ohio Pharmacy Resident Conference.

Efficacy of basal versus prandial insulin transition after diabetic ketoacidosis resolution

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Learning Objectives:

1. Discuss the epidemiology of diabetic ketoacidosis in the United States.
2. Define resolution of diabetic ketoacidosis according to St. Elizabeth Healthcare's protocol.

Purpose:
To determine the efficacy of long-acting, short-acting, or both short-and long-acting insulin regimens after diabetic ketoacidosis (DKA) resolution defined by the prevention of anion gap (AG) reopening and recurrent hyperglycemia.

Methods:
A retrospective chart review was conducted from October 1, 2021 to January 31, 2024 to assess if there is a preferred subcutaneous insulin regimen after resolution of DKA. Patients at least 18 years of age with a diagnosis of DKA were included if they were admitted to a St. Elizabeth Healthcare critical care unit and received an insulin drip. The primary outcome is to compare rates of successful transition from an insulin drip to subcutaneous basal insulin versus prandial insulin after resolution of DKA as defined by prevention of AG reopening (AG greater than 9 on whole blood or greater than 12 on basic metabolic panel) and recurrent hyperglycemia (blood glucose greater than 180 mg/dL). The secondary outcomes are to compare rates of transition failure as defined by the resumption of the insulin drip or the recurrence of DKA, hypoglycemic events (blood glucose less than 70 mg/dL) on an insulin drip, time on the insulin drip, premature transition off insulin drip, and length of hospital stay.

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

Conclusion: Conclusions will be presented at the Ohio Pharmacy Resident Conference.

Risk Factors for Poor Outcomes in Ventilator-Associated Pneumonia Treated with Single Coverage for *Pseudomonas aeruginosa*

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Learning Objectives:

1. Recognize etiology and treatment recommendations for ventilator-associated pneumonia (VAP)
2. Identify potential risk factors in VAP patients treated with single antipseudomonal coverage that can increase treatment failure

Purpose:
Practice guidelines recommend double coverage for *Pseudomonas aeruginosa* VAP even though previous studies have shown no differences in mortality, clinical response, or drug-related adverse events. The purpose of this study was to assess risk factors in VAP patients who failed or successfully completed single *P. aeruginosa* coverage but qualified for double coverage per guidelines.

Methods:
A retrospective case-control study conducted from January 2019 to June 2023 included adult VAP patients that qualified for double coverage and received 48 hours of a single antipseudomonal antibiotic. Patients were divided into two groups if they failed or successfully completed therapy. The primary objective was to determine risk factors associated with treatment failure in VAP patients treated with empiric antipseudomonal monotherapy. Secondary outcomes included days on mechanical ventilation, antibiotics and vasopressors, length of intensive care unit stay, and VAP reoccurrence within 90 days.

Results:
Among 109 patients included in the study, 55 failed treatment and 54 successfully completed treatment. Septic shock at diagnosis and piperacillin-tazobactam monotherapy were both associated with higher rates of treatment failure (43.6% vs. 20.4%; p=0.009; 16.4% vs. 3.7%; p=0.028, respectively). Significant secondary endpoints were number of vasopressors at diagnosis (p=0.016) and days on vasopressors (p=0.001).

Conclusions:
Double antipseudomonal coverage may need to be considered in patients in septic shock at the time of VAP diagnosis and caution should be used when using piperacillin-tazobactam as monotherapy. Larger, prospective studies are needed to demonstrate the association between septic shock and poorer outcomes in VAP patients in order to determine when double antipseudomonal coverage is indicated.

Evaluation of Scanning Failures on Compliance of Barcode Medication Administration (BCMA) within a Rural Health System

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UAN: 0048-0000-24-151-L04-P

Learning Objectives:

1. Identify factors that can lead to decreased BCMA compliance
2. Discuss solutions to address common causes of decreased BCMA compliance

Purpose:
Bar code medication administration (BCMA) has been shown to decrease medication administration errors. Issues may lead to overriding the scan, rendering the technology useless. The Leapfrog Group recommends that over 95% of medications and patients are scanned before administration. Scan rates at Adena Health decreased after the addition of a critical access hospital and transition to a new electronic medical record system. The purpose of this study is to determine the impact of scanning failures on scan rates at Adena Health.

Methods:
This was a retrospective, chart review, quality improvement study that determined the effect of scanning failures on BCMA compliance. The primary outcome of the study was missed scans due to scanners being broken or unavailable, barcodes being unreadable or unavailable, and due to system downtime. Secondary outcomes included missed scans due to all causes, overall scan rates within Adena Health, scan rates within specific areas of each hospital, scans rates of individual medications, and compliance with Leapfrog's recommendation. Inclusion criteria included medication administration data from all Adena Health locations that occurred between 6/1/2023 – 2/29/2024. Exclusion criteria included medications previously identified that do not require a scan prior to administration, including medications in emergent situations such as codes and clinic administered medications.

Results:
The results of this study indicate a statistically significant association between Adena Health sites and decreased BCMA compliance due to scanning failures ($p < .0001$ for all sites). Overall patient scanning rate was 96.56%, medication scanning rate was 95.77%, and BCMA compliance was 95.36%. The department with the lowest BCMA compliance was the emergency department with a compliance of 88.97%. Medications with low scan rates included ophthalmic and oral solutions along with contrast agents.

Conclusions:
This study shows the need for policies that establish workflows for healthcare professionals to address scanning failure causes, such as a procedure to report and replace a scanner being broken. Additionally, Adena Health should periodically perform similar studies in the future to monitor for factors that may decrease BCMA compliance.

Droperidol for the treatment of migraine headaches in the emergency department

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Learning Objectives:

1. Discuss the implementation of a migraine pathway initiating droperidol as first line treatment for migraine headaches
2. Review droperidol's place in treatment strategies in the emergency department (ED)

Purpose:

Migraine headaches can be a debilitating disease that significantly impact patients' lives. Standard migraine headache treatment strategies vary between practice settings. Clinical practice guidelines do not offer set treatment options for patients that present in an emergency setting. Droperidol, an antipsychotic and antiemetic, has become a drug of interest for migraine headache treatment in the ED. The purpose of this study is to assess safety and efficacy of droperidol for the treatment of migraine headaches, along with evaluating the length of stay and cost difference with droperidol compared to more conventional treatment strategies.

Methods:

This quasi-experimental, quality improvement, bidirectional cohort, cost analysis study will take place at Southwest General main campus ED. Patients admitted to the ED with the primary diagnosis of migraine headache will evaluated in two cohort groups. Pre-intervention cohort population will be assessed between October 1st, 2021 to March 31st, 2022. Data will be collected through medical record review and will include: length of stay, medication costs, number of medications administered, side effects, and overall migraine resolution. For the post-intervention group, a migraine headache flow sheet will be designed and available to ED providers with a multi-step approached for migraine headache treatment. The patient's migraine headache symptoms will be reassessed 30 minutes after droperidol administration, at which point other treatment options can be considered if symptoms have not resolved. Data collection for the post-intervention group will take place from January 1st, 2024 to March 31st 2024 and will include the same data as the pre-intervention cohort. The primary outcome of this study is to assess the safety and efficacy of droperidol use in migraine headache treatment. The secondary outcomes include: assessing the change in length of stay and medication costs. Data is actively being collected and will be presented at the Ohio Pharmacy Resident Conference.

Results:

Data analysis is on-going and will be presented at 2024 Ohio Pharmacy Resident Conference

Conclusions:

To be presented at 2024 Ohio Pharmacy Resident Conference

Validation of In-Hospital Hypoglycemia Risk Model Across Corewell Health System

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UAN: 0048-0000-24-153-L01-P

Learning Objectives:

1. Discuss the importance of hypoglycemia prevention in hospitalized patients.
2. Explain how clinical prediction tools are developed and can be applied in an inpatient setting.

Purpose:
Studies have shown that hospitalized patients at risk of hypoglycemia can be identified using validated prediction models which facilitates real-time prevention interventions. In 2021, a derived and validated hypoglycemia predictive model at Corewell Health Dearborn Hospital demonstrated consistency with previously developed risk models and reliably predicted hypoglycemic events. The objective of this study to perform an external validation of this hypoglycemia risk model across the Corewell Health System on separate populations based on site. With this this study we aim to assess the applicability of the model by site, and the generalizability of the risk prediction tool for potential incorporation into the electronic health record (EHR).

Methods:
A retrospective cohort of 500 patients from 19 Corewell Health Hospitals will be enrolled who meet the inclusion criteria of aged 18 years or older, have a diagnosis of diabetes (type 1 or 2), and were admitted in 2022. External validation of the model will be performed for each institution even if the 500-patient minimum is not met. Key exclusion criteria include sites unable to achieve a minimum of five events per hypoglycemia prediction variable and will not be validated with the model due to a projected lack of power. Results of each institution meeting the 500-patient requirement will then be used to create a combined validation cohort to assess the model across the system. Model performance will be assessed by ROC curve and c-statistic. Statistical analysis will be performed using Stata 18 and Microsoft Excel.

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

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

Implementation of a buprenorphine induction program in a community health system

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Learning Objectives:

1. Recognize the impact that the Consolidated Appropriations Act of 2023 has on the future treatment of opioid use disorder.
2. Identify patient factors that suggest a patient is a good candidate for treatment with buprenorphine-naloxone for opioid use disorder.

Purpose:

In the setting of an ongoing opioid epidemic, hospitals and healthcare settings are expanding access to services for opioid use disorder. Hospitals are utilizing buprenorphine induction protocols to provide treatment for opioid use disorder when patients present for acute stabilization, with the goal of keeping patients connected to care after induction. The purpose of this retrospective study is to evaluate enrollment in medication assisted treatment (MAT) thirty days after induction.

Methods:

This retrospective study was approved by the Institutional Review Board. The electronic medical record was used to identify patients from November 8th, 2023 through February 29th, 2024 who received one or more doses of buprenorphine or buprenorphine-naloxone as induction therapy for opioid use disorder (OUD) at St. Elizabeth Healthcare facilities. Patients were eligible for inclusion in the study if they were 18 years or older with reported use of an opioid and experiencing symptoms of withdrawal. Patients were given the option to be inducted with buprenorphine-naloxone for the treatment of OUD. Buprenorphine monotherapy was used in the peripartum setting. Patients were excluded from the study if their buprenorphine-naloxone therapy was a continuation of outpatient treatment, if they were unable to provide consent, or if they had planned or anticipated surgical procedures in the next 72 hours. Patients were stratified into one of three protocols, based on where the induction occurred. The protocols differ to accommodate emergency department, inpatient, and labor and delivery inductions. Patients were evaluated thirty days after induction to determine if medication-assisted therapy for OUD was continued past their initial induction.

Results:

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

Conclusion:

Conclusions will be presented at the Ohio Pharmacy Resident Conference.

Clinical Outcomes of Cefazolin for Non-Surgical Indications Based on Body Weight

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Learning Objectives:

1. Review existing literature surrounding clinical outcomes of patients treated with beta-lactam antibiotics stratified by weight category
2. Discuss the outcomes of patients treated with cefazolin based on body weight

Purpose: Evidence for utilizing higher doses of cefazolin outside of the perioperative prophylaxis setting is not well-established, but observational data suggests that β-lactam failure rates are higher in patients who are overweight. The purpose of this study is to investigate whether cefazolin treatment failure rates in individuals with increased body weight are higher compared to patients with normal body weight.

Methods:
This retrospective, single-center study included patients who received cefazolin for methicillin-susceptible S*taphylococcus aureus* infections between September 2022 and August 2023. Patients eligible for inclusion were at least 20 years old at the time of admission, received ≥48 hours of cefazolin monotherapy, and had a body mass index (BMI) ≥18.5kg/m^2. Patients were categorized based on BMI for weight status.
The primary endpoint was a composite outcome of treatment failure defined as 30-day all-cause mortality, readmission for infection, and worsening signs or symptoms of infection. Individual components of the composite outcome were assessed as secondary study endpoints.

Results: A total of 41 patients were included in this study. The primary outcome was met in 11 patients (26.8%). No significant differences in treatment failure rates were found between the four BMI categories (p=0.239). Additionally, no significant differences were found in the individual components of treatment failure. Treatment failure rates in patients who met the definition of obesity (33.3%) were also compared to treatment failure rates of those who did not (21.7%) though no statistically meaningful difference was found (p=0.406).

Conclusion: Retrospective analysis revealed no significant differences in treatment failure rates of cefazolin therapy when stratified by BMI category. The numeric incidence of treatment failure does appear to be higher in patients with increased body weight, though whether this observation is clinically meaningful cannot be determined. Additional research is needed to further examine the incidence of β-lactam treatment failure in this patient population.

Impact of a Pharmacist Run Statin Clinic

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Learning Objectives:

1. Describe the workflow of a pharmacist-run statin clinic in an underserved patient population
2. Recognize the relationship between a pharmacist telemedicine clinic and the number of statin prescriptions prescribed for eligible patients
3. Investigate ways to improve on a pharmacist-run statin telemedicine clinic

Purpose:
To assess the impact of a pharmacist-run statin telemedicine clinic on statin use in eligible patients at MetroHealth Medical Center. The primary outcome was the percentage of patients on appropriate statin therapy treated by the clinic compared to usual care with the primary care provider. Secondary outcomes included change in LDL at baseline, 6 months, and 12 months; appointment success rate; prescription success rate; and whether patients continued statin therapy.

Methods:
Data was analyzed from October 2021 to October 2023 comparing patients who received pharmacist intervention (n=161) and patients who did not (n=100). Statin prescription data and fill history were obtained via the electronic medical record. The Chi-Square Test of Independence was used to assess associations between nominal data and groups. A Type 1 Error Rate of alpha $\leq$ 0.05 was considered statistically significant.

Results:
Both groups were similar in demographics of sex, primary language, and race (P=0.16, P=0.82, P=0.15). Primary insurance type differed significantly between groups (P < 0.005). In the control group, 39% were prescribed a statin during the study period while in the treatment group, 24% were prescribed a statin (P = 0.012). Statin use showed no significant difference across patients of differing sex, insurance, primary language, or race (P=0.55, P = 0.36, P=0.21, P=0.11). Odds of being on a statin were approximately twice as high for those subjects in the control group compared to those subjects in the treatment group. All other secondary objectives had no significant differences.

Conclusions:
Pharmacist intervention in a telehealth clinic did not increase statin use when compared to usual care. Alternative initiatives should be considered to improve statin use amongst eligible patients, improve patient care, and determine the best utilization of resources.

Impact of Pharmacist Intervention on Achieving Continuous Glucose Monitor (CGM) Goal Time in Range (TIR) in the Primary Care Setting

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Learning Objectives:

1. Review the use of continuous glucose monitors (CGMs) for patients with diabetes in a primary care setting
2. Describe the impact of pharmacist-led CGM management on the time-in-range (TIR) metric

Purpose:

Diabetes is a common health condition affecting over 37 million persons in the United States. Current literature supports CGM use for improving the quality of glycemic control and reducing the risk of hypoglycemia. CGM reports provide metrics that display the amount of time spent in various glucose ranges and additional information about glucose variation compared to the typical A1c measurement. The TIR metric represents the amount of time glucose remains within a range of 70 to 180 mg/dL. Recent studies have shown that pharmacist implementation of CGM management leads to greater A1c reduction and that pharmacists using CGMs as part of diabetes management were able to increase the number of patients meeting A1c goals. No studies to date have looked specifically at pharmacist impact on TIR. The primary objective of this study was to identify the proportion of patients with diabetes who received pharmacist intervention using a CGM that achieved goal TIR, defined as >70% of sensor readings between 70 to 180 mg/dL. Secondary objectives included (1) determination of the mean amount of time required for patients to achieve goal TIR, (2) comparison of hypoglycemic events at baseline and following pharmacist intervention, (3) evaluation of changes in glucose variability expressed as coefficient of variation (CV) following pharmacist intervention, and (4) identification of barriers to CGM use.

Methods:

A retrospective chart review was conducted within a network of seven internal medicine primary care clinics from July 2022 to July 2023. Patients were included within the study if they had a diagnosis of diabetes, engaged with the pharmacy team via a collaborative practice agreement, and utilized a CGM with connection to a software platform. Patients with an A1c $\leq$9% at the time of referral to pharmacy, aged <18 years old, or with CGM activity $\leq$70% were excluded.

Results:

During the study period, 24% of patients reached goal TIR, with a mean length of time to reach goal TIR of 45 days. The frequency of hypoglycemic events and mean CV was similar pre- and post-pharmacist intervention. Additionally, 72% of patients experienced barriers to CGM use.

Conclusions:

Further research is needed to evaluate continued barriers with CGM use as more products become available, as well as the impact that pharmacists can have within this area.

Analgesia-first sedation in acutely agitated trauma patients

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Learning objectives:

1. Describe the relationship between acute pain and agitation in trauma patients
2. Review the impact of an analgesia-first sedative approach in acutely agitated trauma patients

Purpose:
Both physical injuries and therapeutic interventions during evaluation may cause significant acute pain to the trauma patient at initial presentation. Trauma complicated by acute agitation may challenge providers to offer analgesia prior to sedation, despite current guideline recommendations for analgesia-first sedation. The purpose of this study was to determine whether analgesic administration to acutely agitated trauma patients prior to sedatives reduces the need for rescue doses of sedative medications.

Methods:
This IRB-approved single-center retrospective cohort study was conducted at an urban, level I trauma center. All patients aged 18 and older with a trauma activation and receipt of a sedative agent (droperidol, haloperidol, ziprasidone, olanzapine, lorazepam, midazolam, or phenobarbital) in the trauma bay between January 1, 2017 and December 31, 2022 were included. Patients with a seizure in the trauma bay or intravenous ketamine at a dose greater than 0.35 mg/kg were excluded. The primary outcome was the number of patients requiring rescue doses of sedative agents, compared between patients with analgesic-first and sedative-first approaches. Additional outcomes included inpatient mortality, incidence of intubation or physical restraints within 6 hours of arrival, time to initial computerized tomography scans, and time to an emergency department room.

Results:
A total of 206 patients met study criteria, with 52 in the analgesia-first group compared to 154 in the sedative-first group. Patients in the analgesia-first group were significantly less likely to receive rescue doses of sedative agents (38.5% vs. 57.1%, p=0.020), but experienced greater delay to an ED room than those in the sedative-first group (76.92 mins vs. 65.16 mins, p <0.001). Other secondary outcomes were similar between groups.

Conclusions:
Consistent with prior literature, utilization of analgesic-first sedation was associated with a reduction in repeated sedative medications. Therefore, whenever safe, we suggest administration of analgesic medications prior to sedative medications in acutely agitated trauma patients.

Effect of Continuous Glucose Monitoring on Glycemic Control for Patients with Type Two Diabetes Enrolled in an Employee Wellness Program

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Learning Objectives:

1. Review continuous glucose monitoring (CGM) systems and qualifications for use
2. Discuss CGM metrics and glycemic targets for patients with type two diabetes recommended by the American Diabetes Association (ADA)

Purpose:

Type two diabetes mellitus is a prevalent disease affecting millions of people in the United States. Historically, glycated hemoglobin (HbA_{1c}) has been considered the gold standard when determining long-term glycemic control in patients with diabetes. However, HbA_{1c} measurements do not provide information on daily glucose levels, and measurements can be subject to variations in accuracy among certain patient populations. Within recent years, the ADA has recommended the use of CGM as a method for optimizing glucose levels, glycemic variability (GV), and daily therapeutic time in range (TIR) levels. This study aims to determine the effect of CGM on TIR glucose levels in Bon Secours Mercy Health (BSMH) employees on less intensive diabetes therapies.

Methods:

This retrospective observational study reviewed employees who were ineligible to receive a CGM system through BSMH insurance between August 8, 2022, and October 25, 2022. Patients were included if they were aged 18 years and older and had previous experience wearing a continuous glucose monitor. Eligible participants were required to wear a Dexcom G6 monitor and have access to the Dexcom Clarity application on a smart device. The primary outcome is to determine improvement in TIR after implementation of the Dexcom G6 by day 60. Secondary outcomes were as follows: improvement in GV, mean glucose, assessment scales (PAID-5 and DES-SF) and HbA_{1c}. The primary and secondary outcomes will be analyzed using the paired t-test. Assessment scales will be interpreted using the Wilcoxon signed-rank test and a p-value of <0.05 will be considered statistically significant.

Results:

There were 19 participants evaluated after meeting inclusion criteria. At the time of Dexcom placement baseline mean TIR was 79.29%. After completion of the study, mean TIR was 84.94% (p=0.027). Secondary outcomes including mean glucose, mean HbA_{1c}, and the results of the assessment scales improved at the end of the study. Conversely, 8 out of 17 (47%) participants didn't attain additional improvement in GV (p=0.61). However, all patients were previously at GV goal prior to the initiation and following completion of the study.

Conclusions:

CGM yielded a statistically significant response in improving TIR levels. These findings support the use of continuous glucose monitors in patients regardless of diabetes therapy. This data could assist with extending BSMH's insurance plan by covering CGM systems in employees using non-insulin or less intensive insulin therapies.

Association Between the Use of Long-Acting Insulin and Hypoglycemia in Critically Ill Patients with Diabetes

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Learning Objectives:

1. Describe the consequences, risk factors, and current management for hypoglycemia and stressed induced hyperglycemia in critically ill patients
2. Review available literature on the use of long-acting insulin in critically ill patients
3. Discuss methods and results of our study analyzing the association between the use of long-acting insulin and hypoglycemia in critically ill patients

Purpose:

Hypoglycemia (BG <70 mg/dl) and hyperglycemia (BG>180 mg/dl) are associated with increased mortality. Various factors such as nutrition, tapering of steroids, and fluctuating stress levels in the Surgical Intensive Care Unit (SICU) lead to increased glucose variability making it difficult to initiate an accurate insulin regimen. Therefore, the purpose of this study is to assess the proportion of critically ill patients who develop hypoglycemia when using long-acting insulin plus sliding scale compared to sliding scale alone.

Methods:

This is a single-center, retrospective cohort study evaluating adult patients with type 2 diabetes (T2DM), admitted to SICU for >24 hours or < 14 days. Patients were excluded if they had type 1 diabetes, never received insulin from the sliding scale, were on total parenteral nutrition (TPN), or on an insulin pump. Also, patients were excluded if admitted for intentional insulin overdose, diabetic ketoacidosis, or hyperosmolar hypoglycemic state, or expired within two days of SICU admission.
The primary outcome was to compare the incidence of hypoglycemia in critically ill patients with T2DM, receiving long-acting plus sliding scale insulin to those receiving sliding scale insulin alone. Secondary outcomes included number of hypoglycemic events per patient over their ICU length of stay, proportion of severe hypoglycemia, hypoglycemia, euglycemia, and hyperglycemia events, blood glucose variability, and inpatient mortality between the groups. Association between severe hypoglycemia and hypoglycemia and average daily long-acting insulin dose, along with the comparison of percentage of insulin dose initiated in the ICU to home insulin regimen were also evaluated.

Results:

Data collection is ongoing, analysis is pending completion of data collection. Results will be presented at the Ohio Pharmacy Residency Conference.

Conclusions:

To be presented at the Ohio Pharmacy Residency Conference.

Effect of single doses of droperidol or haloperidol on QT prolongation

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Learning Objectives:

1. Discuss the use of droperidol and haloperidol in practice pertaining to effects on QT interval.
2. Review the impact of single doses of droperidol or haloperidol on QT interval.

Purpose:

Droperidol and haloperidol are nonselective dopamine receptor blockers with clinical indications in the acute care setting, including postoperative nausea and vomiting and agitation. One signature side effect of both medications includes electrocardiogram (EKG) changes, such as QT prolongation. This may lead to torsades de pointes (TdP), a life-threatening arrhythmia. The FDA placed a black box warning on droperidol in 2001 following a review of post marketing reports detailing QT prolongation and subsequent development of TdP. The primary objective of this study is to evaluate the change of the QT interval following a single dose of droperidol or haloperidol. Additionally, this study sought to identify the adherence of an institution to the EKG requirements stated in formulary requirements for droperidol use.

Methods:

This study entailed a retrospective chart review of inpatient medical records of adult patients that received a single dose of either droperidol or haloperidol from September 1, 2021, to August 31, 2023. Patients that received repeat doses of haloperidol or droperidol within 30 days, had a permanent pacemaker, right bundle branch block on EKG, atrial fibrillation on EKG with heart rate ≥ 120 bpm, received ≥ 3 scheduled QT prolonging medications from a prespecified list, pre-dose serum potassium ≤ 3.5 mg/dL, or pre-dose serum magnesium ≤ 1.6 mg/dL were excluded. The primary outcome is the presence of QT prolongation following administration of a single dose of droperidol or haloperidol. Secondary outcome measures include the presence of torsades de pointes within 48 hours of droperidol or haloperidol use, presence of death within 24 hours of droperidol or haloperidol use, QT interval change after doses of droperidol greater than 2.5 mg, and percentage of orders that are compliant with the Bon Secours Mercy Health System EKG requirements for droperidol use.

Results:

Data analysis in progress.

Conclusions:

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

Increasingly Loose Carbapenem Use: Trends in Carbapenem Usage in Relation to Beta-Lactam Allergy Documentation

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Learning Objectives:

1. Review the literature available for beta-lactam allergy reporting, the overall impact of poor consistency and accuracy regarding allergy documentation, and carbapenem usage trends in patients with documented beta-lactam allergies.
2. Describe how beta-lactam allergy documentation trends impact the use of carbapenem agents.
3. Discuss solutions to improve accuracy and consistency trends for allergy reporting in order to prevent the unnecessary use of carbapenem agents.

Purpose:

The impact of allergy documentation and lack of clarity for each individual reaction has been assessed in previous studies. Data has shown that incorrect allergy documentation can lead to the use of non-preferred agents, most notably carbapenems that are typically reserved for multidrug resistant organisms. The overuse of such agents can lead to increased resistance and complicates antimicrobial stewardship decision making. The resulting increased resistance is a trend that University Hospitals Parma Medical Center has experienced over the past few years. This study aims to investigate the relationship between documented beta-lactam allergies and the use of carbapenem agents at University Hospitals Parma Medical Center with an emphasis on identifying areas of improvement.

Methods:

Data was collected through retrospective chart review. This single-center study assessed a total of 200 randomly selected patients from a pool of 1,541 subjects that received antibiotic therapy with a documented beta-lactam allergy from October 1st, 2023 – March 31st, 2024. The primary objective is to determine the incidence of carbapenem agents prescribed in patients with a documented beta-lactam allergy. The secondary objectives include the incidence of a beta-lactam versus a non-beta-lactam agent being prescribed, the impact of allergy documentation on carbapenem prescribing (reaction description, specific beta-lactam agent identified, and additional comments provided), and the proportion of patients without a notable reaction description overall. All incidence and proportion data will be analyzed via descriptive statistics, and categorical data will be analyzed via chi-square analysis.

Results:

Data is in the process of being analyzed. Final results will be presented at the Ohio Pharmacy Residency Conference.

Conclusions:

Conclusions will be presented at the Ohio Pharmacy Residency Conference.

Impact of education on antibiotic selection in penicillin allergic patients

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Learning Objectives:

1. Review primary literature to support the use of cefazolin in patients with low severity penicillin allergies.
2. Discuss the impact of pharmacist-led education over cefazolin use in patients with a penicillin allergy on the rate of optimal preoperative antibiotic use.

Purpose:

According to the 2014 ASHP guidelines, cefazolin is the recommended preoperative antibiotic in many procedures in patients that do not have a beta lactam allergy because of its adverse effect profile, spectrum of activity and low cost. Supporting evidence shows that cefazolin does not cross react with other beta lactams due to its unique side chain. A preliminary report from an allergy work group within the OhioHealth Antimicrobial Stewardship team from May 2023 to July 2023 showed that 1174 patients received alternative antibiotic therapy with clindamycin out of 1966 preoperative patients with a documented penicillin allergy. Multiple studies show that providing education to surgery providers results in an increased use of cefazolin in penicillin allergy patients.

Methods:

This project aims to increase the utilization of preoperative cefazolin in patients that have a low severity penicillin allergy at OhioHealth. The project will look at data prior to providing education to surgery providers from August 2023 to October 2023 and after providing education from January 2024 to March 2024. The education consists of a 15-minute PowerPoint presentation and a handout to all OhioHealth hospital sites in November and December 2023. Patients included in this project are at least 18 years old with a penicillin allergy who are receiving cefazolin or clindamycin for surgical prophylaxis. Patients will be excluded if they receive other topical or systemic antibiotics. The primary outcome assesses the impact of clinical education on the use of preoperative cefazolin and clindamycin in patients with a documented penicillin allergy. The secondary outcome assesses the need for continuous education on the topic by determining whether antibiotic usage is sustained each month after education.

Results:

This project's results will be presented at the Ohio Pharmacy Resident Conference.

Conclusions:

This project's conclusions will be presented at the Ohio Pharmacy Resident Conference.

Retrospective non-inferiority study of Aprepitant 32.4mg IV versus Aprepitant 80 mg PO in the Prevention of Postoperative Nausea and Vomiting in Patients Undergoing Laparoscopic Sleeve Gastrectomy

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Learning Objectives:

1. Explain the mechanism of action of aprepitant
2. Discuss current literature available on aprepitant in the treatment of post-operative nausea and vomiting (PONV) in laparoscopic sleeve gastrectomy
3. Evaluate the role of aprepitant IV versus PO in the prevention of post-operative nausea and vomiting (PONV) in laparoscopic sleeve gastrectomy patients

Purpose:

Obesity is an international public health crisis with more than 1 billion overweight adults, and at least 300 million of them being obese. For patients with morbid obesity (class II or III obesity), surgical management remains the only evidence-based approach that achieves clinically important and sustainable weight loss. Postoperative nausea and vomiting can cause increased length of stay and patient dissatisfaction. In bariatric surgery, PONV incidence has been reported in as high as 79%. There is evidence to suggest that PO aprepitant has benefit, but no study to date has investigated the impact of Aprepitant IV in this patient population. The aim of this study is to evaluate if aprepitant 32.4mg IV is noninferior to aprepitant 80mg PO in prevention of post-operative nausea and vomiting in laparoscopic sleeve gastrectomy patients.

Methods:

This was an IRB-approved retrospective non-inferiority study that compared the incidence of post-operative nausea and vomiting (PONV) following the administration of aprepitant 32.4mg IV versus aprepitant 80mg PO in laparoscopic sleeve gastrectomy from May 2022 to February 2024 with a target of 200 patients in each group. IV aprepitant was studied from April 2023 to February 2024, while oral aprepitant was studied from May 2022 to April 2023. Three-hundred and eighty nine patients were identified as candidates and received a dose of aprepitant. The number of doses of anti-emetics used at PACU +1 hour, PACU + 12 hours, PACU +24 hours and total number of doses administered were recorded. Length of stay defined as whole number in days was also recorded.

Results:

To be presented at the 2024 Ohio Pharmacy Resident Conference.

Conclusions:

To be presented at the 2024 Ohio Pharmacy Resident Conference.

Evaluation of Comprehensive Medication Review Quality Performed by Community Pharmacists

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Learning Objectives:

1. Describe the impact of comprehensive medication review (CMR) outcomes and acceptance of community pharmacist recommendations.
2. Evaluate CMR quality by assessing the percent with drug therapy problems (DTPs) identified, along with number and type of DTP resolved.
3. Identify differences between CMR mode of delivery and type of DTP resolved.

Purpose:

The purpose of this study is to evaluate the quality of CMRs performed in community pharmacies to demonstrate pharmacists effectively address therapy gaps. Pharmacists are experienced in completing CMRs as medication therapy management (MTM) is an essential pharmacy service. Further studies are needed to determine the acceptance of pharmacist recommendations through CMRs. The primary objective is to evaluate the quality of CMRs performed by assessing the percent with DTPs identified and number of therapy gaps resolved. The secondary objectives are to assess CMR quality based on mode of delivery and to evaluate if trends exist between SVI score and DTPs identified.

Methods:

This study retrospectively evaluated CMR quality performed by pharmacists in a large community pharmacy chain between 2021 and 2022. The chain operates over 2,200 pharmacies across 35 states. A random sample of 5,000 patients was selected from 2021 and 2022, stratified based on age and gender for a total of 10,000 patients. Another random sample of 5,000 patients will be selected from the 2023 calendar year in June of 2024. During the study period, pharmacists utilized an existing MTM platform that identifies and targets patients for CMRs based on Centers for Medicare and Medicaid Services eligibility criteria. Patient-specific information from the MTM platform was cross-referenced with the pharmacy management system to evaluate study objectives. The primary objective, percent of CMRs with DTPs identified, was evaluated for addressed therapy gaps six months post CMR completion. This study evaluated therapy gaps such as adherence, vaccine, new refill program enrollment, and other therapy gaps from the existing MTM platform. The secondary objective, impact of CMR quality based on mode of delivery, was assessed using chi-squared test. For the secondary objective, SVI score and DTPs identified, investigators will utilize the Centers for Disease Control and Prevention's SVI from the U.S. Census Bureau of 2022 to determine community social vulnerability based on the pharmacy's geographic location. An internal retail data insight company will cross-reference SVI score with patient-specific information from the pharmacy management system and existing MTM platform to determine if a trend exists. All study objectives will be evaluated using descriptive statistics.

Results:

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

Conclusions:

Preliminary conclusions will be presented at the Ohio Pharmacy Residency Conference.

Initiation of Guideline Directed Medication Therapy in De Novo Heart Failure with Reduced Ejection Fraction Patients Requiring Open Heart Surgery Compared to Non-Surgical Patients

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Learning Objectives:

1. Identify rates of HFrEF GDMT prescribing in surgical and nonsurgical populations
2. Discuss areas for improvement of GDMT prescribing rates in clinical practice

Purpose:
Guideline directed medication therapy (GDMT) for heart failure with reduced ejection fraction (HFrEF) is recommended to reduce morbidity and mortality within the patient population and earlier initiation has been shown to be associated with improved outcomes. However, rates of GDMT initiation in patients undergoing open heart surgery (OHS) are unclear. This study's aim is to provide insight into GDMT initiation at an academic tertiary care center for de novo HFrEF patients after OHS.

Methods:
This was a single center, retrospective cohort study performed at a 794-bed academic medical center. Eligible patients were age ≥18 years and identified to have de novo HFrEF with a left ventricular ejection fraction of ≤40%. Patients with a prior heart failure diagnosis, baseline eGFR 2.0 mg/dL, or history of angioedema or anaphylaxis to any GDMT class medication were excluded. The primary outcome was the number of GDMT medications ordered at hospital discharge, and select secondary outcomes included number of GDMT medications at 30-day follow-up, frequency of adverse events, and 30-day hospital readmission rate.

Results:
A total of 539 patients admitted during the study timeframe were screened and 77 eligible patients were included, with 12 patients assigned to the cardiac surgery group and 65 patients included in the nonsurgical group. Median GDMT agent use at baseline was minimal (0 vs. 0) and comorbidities were similar between groups. The primary outcome of mean number of GDMT class medications at hospital discharge was found to be 2.3 ± 0.9 medications in the surgical group compared to 2.6 ± 1.2 medications in the nonsurgical group.

Conclusions:
Of eligible patients with de novo HFrEF who required OHS, actual rates of GDMT prescribing were found to be similar to patients with de novo HFrEF who did not require OHS during their encounter of HFrEF diagnosis.

Evaluation of Cost Savings Associated with Lipid Lowering Therapy Optimization Program in Post Acute Myocardial Infarction Patients

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UAN: 0048-0000-24-167-L01-P

Learning Objectives:

1. Recall the current guideline recommendations regarding cholesterol management for secondary prevention per ACC/AHA and JACC.
2. Describe the impact of pharmacist-led lipid lowering interventions on patient's cardiovascular healthcare expenditures.
3. Discuss how pharmacist-led lipid lowering interventions satisfy hyperlipidemia CMS measures.

Purpose:

At St. Elizabeth Healthcare – Edgewood hospital, patients diagnosed with an acute myocardial infarction (AMI) receive lipid lowering therapy (LLT) optimization during inpatient stay. Upon discharge, AMI patients are referred for pharmacist managed LLT in the outpatient setting to ensure continuation of LLT optimization. In a previously conducted study, this referral service demonstrated greater LDL reduction and achievement of LDL goal <70 mg/dL at a significantly faster rate compared to non-pharmacist led LLT optimization. The objective of this study is to compare patient's cardiovascular healthcare expenditures post AMI, and achievement of CMS hyperlipidemia measures in pharmacist led vs. non-pharmacist led optimization.

Methods:

Patients admitted for an AMI at St. Elizabeth Healthcare with an LDL ≥ 70 mg/dL, ≥18 years old, and followed by a St. Elizabeth provider in the outpatient setting were included in this study. Data collected from November 1st, 2018, to December 31st, 2019 served as the control group, with no pharmacist lipid lowering intervention. Data collected from December 1st, 2021 – March 31st, 2023 served as the intervention group. Within this intervention group, pharmacists in the inpatient setting placed a referral to either the St. Elizabeth specialty pharmacy for initiation and management of a PCSK9-inhibitor, or inclisiran, or to the St. Elizabeth outpatient pharmacists for non-PCSK9-inhibitor or inclisiran hyperlipidemia management. Comparison of these identified patient's healthcare cardiovascular expenditures post AMI were conducted. Additionally, achievement of CMS measures, specifically statin use in persons with cardiovascular disease (SPC), were compared.

Results:

Data collection and analysis are in process and to be presented at OPRC.

Conclusions:

To be presented at OPRC.

Incidence of Acute Clinically Significant Hyponatremia in ICH with or without DDAVP for Patients on Anti-Platelet Therapy

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Learning Objectives:

1. Describe the incidence of clinically significant hyponatremia
2. Evaluate the use of desmopressin in traumatic intracranial hemorrhage

Purpose:
Traumatic brain injury (TBI) with intracranial hemorrhage (ICH) may result in neurological deficit from hematoma expansion or electrolyte disturbance associated with the injury. For patients on anti-platelet therapy, desmopressin (DDAVP) may be an appropriate treatment option as it potentiates platelet aggregation. However, this therapy contains a black box warning for hyponatremia. The extent to which DDAVP contributes to hyponatremia in ICH is unknown. The purpose of this study is to define the incidence of acute hyponatremia for patients with ICH on anti-platelet therapy with or without DDAVP.

Methods:
This institutional review board approved, single-center, retrospective review was conducted from September 2021 to August 2023 at an academically affiliated Level III trauma center. This study evaluated patients admitted to the institution's trauma service and divided patients into two treatment arms: received DDAVP or did not receive DDAVP. Patients were assessed for acute clinically significant hyponatremia, defined as sodium <135 and a decrease in sodium $\geq$ 6 mEq. Included patients must have been $\geq$ 18 years of age, radiographic evidence of traumatic ICH, admitted > 48 hours, and received anti-platelet therapy prior to admission. Patients were excluded if their initial sodium was <130 or >145 mEq, no repeat sodium $\leq$30 hours, received DDAVP >6 hours after arrival, were pregnant, or incarcerated. The primary outcome assessed was the incidence of acute clinically significant hyponatremia.

Results:
A total of 35 patients were identified, of which, 19 did not meet inclusion criteria. Therefore, 16 patients were assessed, with 13 in the DDAVP arm and 3 in the non DDAVP arm. The primary endpoint did not find statistical significance with P value=1.

Conclusions:
Overall, this study showed no significance for hyponatremia following DDAVP administration in patients with ICH. A further analysis will be completed to assess secondary and safety outcomes.

Evaluation of Pharmacist-Led Penicillin Allergy Assessments

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Learning Objectives:

1. Review existing literature and guidance on penicillin allergy assessments and the use of de labeling protocols to improve antimicrobial stewardship metrics
2. Discuss the feasibility and effectiveness of a pharmacist-led process for evaluating penicillin allergies

Purpose:
Pharmacists may play an essential role in confirming reported penicillin allergies and facilitating oral β lactam graded challenges due to their integration into multidisciplinary patient care teams. This study aimed to evaluate the feasibility and effectiveness of a pharmacist-led penicillin allergy evaluation.

Methods:
This retrospective pilot evaluation included adult patients with penicillin or amoxicillin allergies admitted to the University of Toledo Medical Center from November 13th, 2023, through January 31st, 2024. Pharmacists utilized a standardized questionnaire to interview patients regarding the nature of their penicillin or amoxicillin allergy. Low-risk allergy patients were evaluated for participation in a de-labeling protocol which included either an oral β-lactam graded challenge or direct de-labeling. Key exclusion criteria include pregnancy, hemodynamic instability, and patients with other β-lactam allergies. Primary objectives included the percentage of de-labeled patients and the median pharmacist time spent per patient interview. Secondary objectives included percentages of patients whose allergies were updated in the medical record, de-labeled patients who subsequently received β-lactam agents, and adverse reactions related to penicillin or amoxicillin during oral graded challenge, if applicable.

Results:
Seventy-three patients were included in this study. Fifty-six percent (41 patients) patients were identified as low-risk of IgE-mediated penicillin allergy and prompted to be eligible for the de-labeling process. Of those identified as low-risk, twenty-six patients (63%) were successfully de-labeled, and the median time spent per interview was 9 minutes (8-10 minutes). Pharmacist interviews identified 72 patients requiring an updated reaction and/or severity in the electronic medical record. All de-labeled patients were prescribed β-lactam agents and those who were de-labeled via oral graded challenge did not experience any immediate or delayed-onset reactions.

Conclusions:
Our findings support the expansion of pharmacist-led penicillin allergy evaluations. These findings will help decrease inappropriate antimicrobial use and reduce the risk of adverse events associated with incorrect penicillin allergy reports.

Impact of Diabetes on Post-Operative Morbidity and Mortality in Cardiac Surgery

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Learning Objectives:

1. Identify risk factors associated with hyperglycemia during cardiac surgery
2. Describe the guideline recommendations for perioperative glucose management during cardiac surgery

Purpose:

Perioperative hyperglycemia (glucose ≥180 mg/dL) has been shown to be a risk factor of post-operative morbidity and mortality for patients undergoing cardiac surgery with cardiopulmonary bypass (CPB). Guidelines recommend using continuous insulin infusions during the perioperative period to maintain glucose <180 mg/dL. Patients with diabetes are at increased risk of developing hyperglycemia during cardiac surgery. The purpose of this study is to evaluate the impact of diabetes on post-CPB morbidity and mortality.

Methods:

This was a single center, retrospective study of adult patients who underwent cardiac surgery with CPB January 1, 2022 – January 1, 2023. Data was collected from electronic health records and Society of Thoracic Surgeons database. Diabetes was identified from past medical history on admission. The primary outcome was composite 30-day mortality and morbidity, including surgical site complications, sepsis, pneumonia, bacteremia, stroke, myocardial infarction. Secondary outcomes included individual components of morbidity, length of intensive care unit (ICU) and hospital stay, and new arrhythmia.

Results:

Of 473 patients included, 170 had diabetes, 303 did not have diabetes. Baseline characteristics were similar between groups. Average glucose was higher in the diabetes group intraoperatively (154.8 vs 136.2 mg/dL, $p<0.001$) and 24-hours postoperatively (145.7 vs. 137.8 mg/dL, $p<0.001$). Patients with diabetes received more insulin intraoperatively (13.8 vs. 6.7 units, $p<0.001$). The primary outcome occurred in 26 patients (15.3%) with diabetes and 56 patients (18.5%) without diabetes ($p=0.380$). No significant differences in ICU and hospital length of stay (4.1 vs. 4.1 days and 10.7 vs. 10.2 days, respectively), or new arrhythmias (53.5% vs. 50.1%) were observed.

Conclusions:

There was no difference in 30-day morbidity and mortality between patients with and without diabetes undergoing CPB. Average intraoperative glucose was higher in patients with diabetes but remained <180 mg/dL. Future randomized studies are needed to further evaluate the impact of diabetes on these patients.

Sepsis bundle compliance before and after implementation of a protocolized sepsis program

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Learning Objectives:

1. Review literature and guideline recommendations for the management of patients with sepsis
2. Describe the impact of a protocolized approach to sepsis management

Purpose:

Sepsis is a life-threatening medical emergency with a high mortality risk in the absence of prompt medical attention. Protocolized approaches to sepsis management, or "sepsis bundles," have been increasingly adopted by medical institutions to improve clinical outcomes and compliance rates. This study evaluated the effects of a protocolized sepsis algorithm to improve Centers for Medicare & Medicaid Services hour-3 bundle compliance.

Methods:

This retrospective, single-center study included patients age ≥ 18 years admitted for severe sepsis or septic shock who received at least one dose of antibiotics within 24 hours of admission, either Pre-Code Sepsis (PC) between 3/15/22 and 6/15/22, or After-Code Sepsis implementation (AC) between 3/15/23 and 6/15/23. Patients were excluded if sepsis resuscitation began at an outside hospital. The Code Sepsis program consists of a team-based algorithm of sepsis bundle components including but not limited to clinical assessments, fluids, antibiotics, laboratory studies to enhance timely completion of bundle requirements. The primary outcome evaluated hour-3 bundle compliance. Secondary outcomes included hour-1 and hour-6 bundle compliance. Data were analyzed using SPSS v.29.0.

Results:

Of 730 patients identified, a convenience sample of 333 patients was utilized. In total, 118 patients were included (59 PC vs. 59 AC). Overall, baseline characteristics were similar, with a mean age of 63±18 years, 45% male, and 42% with a diagnosis of septic shock. A trend to significance was observed for the primary outcome of hour-3 bundle compliance (25% PC vs. 41% AC, p=0.07), with a similar trend observed for hour-6 bundle compliance (51% PC vs. 64% AC, p=0.13). Hour-1 bundle compliance significantly improved after Code Sepsis implementation (10% PC vs. 24% AC, p=0.03). Hospital length of stay was significantly shorter in the AC group (8[0.7 – 50] PC vs. 5[0.4 – 34] AC, days, p=0.005); however, no significant difference between all-cause mortality (20% PC vs. 10% AC, p=0.13) or disposition to hospice (8% PC vs. 2% AC, p=0.20) was noted between groups.

Conclusions:

Implementation of protocolized Code Sepsis program was associated with a trend toward improved hour-3 and hour-6 bundle compliance and led to significantly improved hour-1 bundle compliance as well as reduced hospital length of stay. Given the widespread use of protocolized approaches to sepsis management, further prospective studies of this approach are necessary to determine the impact on mortality.

Innovating an End-user Drug Donation Program Following Ohio Repository Law Expansion

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Learning Objectives:

1. Define what an end-user donation is
2. List the entities that may accept end-user donations
3. Explain St. Vincent de Paul Charitable Pharmacy's workflow for accepting end-user donations

Purpose:

Located in Cincinnati, Ohio, St. Vincent de Paul Charitable Pharmacy (SVDPCP) is a last resort, safety net option for uninsured and underinsured individuals living in Southwestern Ohio that provides prescription medications and other clinical services for no charge. Presently, 87% of prescriptions are filled with donated drugs from licensed distributors and redistributors. However, many medications remain unavailable. SVDPCP and other community partners collaborated with Ohio legislators to expand repository law. House Bill 558 was signed into law, permitting SVDPCP to accept its first patient (end-user) donations on June 1st, 2023. The purpose of this report is to outline the complete SVDPCP workflow process and how the process was optimized and assessed for sustainability.

Methods:

SVDPCP developed initial policy and procedures regarding donations by end-users using a very limited formulary: insulin/glucagon-like peptide agonists (GLP1s), blood thinners, and inhalers. Three two-week Plan-Do-Study-Act (PDSA) cycles were completed as part of a longitudinal quality improvement project with the global aim of reducing the time passing between end-user donation acceptance and medication redispensing, indicating increased efficiency. Data collection related to the cost-savings and benefits of the program was collected six months pre and post end-user donation implementation from internal workload reports, data stored within the prescription processing software, and drug purchasing invoices. This data included number and type of donations received, portion of prescriptions dispensed monthly from donated repository sources, and financial expenditures by SVDPCP on medications. These outcomes were analyzed using descriptive statistics.

Results:

In the first six months following implementation of end-user donations, 209 donations were received. Most of these donations (53%) were of injectable diabetes medications. During this same six-month period, a cost savings of $5,374 was observed from reduced drug purchasing by SVDPCP due to the donations being received. Ther average portion of prescriptions dispensed from repository sources increased from 14.6% in the six months preceding implementation, to 30.3% post-implementation.

Conclusions:

This new end-user drug donation program is one of the first of its kind in Ohio and could potentially serve as a framework for other drug repository programs in the state. Re-dispensing unused medications has been shown to reduce the expenses of drug procurement for SVDPCP. This program may increase access to medication for those in need and reduce drug waste.

Evaluation of the initiation of a pharmacist-led professional continuous glucose monitoring (CGM) program

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Learning Objectives:

1. Describe the benefits of using CGM in adults with diabetes.
2. Discuss the differences between personal and professional CGM.
3. Assess initial results of a professional CGM program implemented into a family medicine clinic.

Purpose:

The purpose of this program is to provide a pharmacist-initiated service to individuals who would otherwise not be able to receive a CGM. It was also done to better understand how to integrate new patient services into primary care offices to increase healthcare access, including diabetes technology.

Methods:

Patients will be referred to the professional CGM clinic within the family medicine primary care office through internal referrals placed in the electronic medical record (EMR). Once the patients have been referred to the professional CGM clinic, the pharmacist will reach out to the patients to schedule a 30 – 45-minute appointment for them to attend in person. At the beginning of the appointment, patients will receive a quick survey about their perceptions of what CGM is and what it can do for glucose management. After completion, patients will then participate in a quick educational session about CGMs and have a professional CGM sensor placed on them. A pharmacist will assist the patient with setting up their CGM to their smart phone device and answer any remaining questions they might have. Patients will be provided a food journal as well to keep track of their diet during the time that they are wearing the CGM. Before leaving, patients will set up a follow up appointment in 10 days. At the follow up clinic appointment, the sensors will be removed, the patient's data will be reviewed with them individually, and another short presentation will be given by a pharmacist about what those results mean. Patients will then be asked to complete another survey about their understanding of CGM after use and their overall feedback for the program. The pharmacist will pass along the resulting CGM data to the referring physician for clinical review and interpretation.

Results:

Results from the survey are still being compiled and will be presented at the conference.

Conclusions:

Overall, both patients and providers felt like the program was beneficial for the patient's understanding of their blood sugars throughout the day. They either agreed or strongly agreed after the completion of this program that they would better understand how both food and medications affect their blood sugars. For future iterations of this program, we will change how the survey is provided for the patients and ensure that proper billing practices are implemented before enrolling more patients.

Effects of a pharmacist-led deprescribing initiative in a family medicine residency clinic

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Learning Objectives:

1. Define polypharmacy and deprescribing and their associated risks of adverse drug events and drug-related costs.
2. Recognize the pharmacist's role on care teams in deprescribing.

Purpose:

The purpose of this study is to assess the utilization of a novel pharmacist developed deprescribing initiative in a geriatric population in a primary care setting at Mercy Health St. Rita's Family Medicine Residency Clinic. The primary outcome will be the number of medications deprescribed; secondary outcomes will include cost savings, pharmacist intervention time, and 30-day hospital admission and emergency department visits post-intervention. Deprescribing data will be compared with previous year data.

Methods:

This will be a single center, prospective chart review of outpatient medical records. The electronic medical record will be utilized to identify patients in the Family Medicine Residency Clinic with an appointment who meet inclusion criteria. Patients aged 65 years and older with 5 or more medications on their home medication list will be included in the study. Before a patient's appointment, a pharmacist will review the patient's medications and provide recommendations to the medical residents and/or attending physicians regarding all medications eligible for deprescribing. Pharmacist interventions and number of medications deprescribed will be tracked along with secondary outcomes. The study will take place from January to February, 2024. Data will be compared to the same data points from January through February, 2023.

Results:

Final results to be presented.

Conclusions:

Final conclusions to be presented.

Psychiatric Relapse Rates with Voluntary Versus Involuntary Inpatient LAIA Use

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UAN: 0048-0000-24-175-L01-P

Learning Objectives:

1. Recall the current recommendations for long-acting injectable antipsychotic (LAIA) use in serious mental illness (SMI)
2. Discuss the clinical and safety outcomes associated with LAIA use in patients with schizophrenia, schizoaffective disorder, or bipolar I disorder

Purpose:

Medication nonadherence is a challenge for many chronic illnesses, particularly schizophrenia and other serious mental illness (SMI) where patients may lack insight and social support. Maintenance treatment is often necessary for psychiatric stability, but negative perceptions and side effects may result in nonadherence leading to illness progression, relapse, rehospitalization, increased medical costs, and increased suicide rates. Long-acting injectable antipsychotics (LAIAs) were developed to improve adherence and decrease hospitalization; they are a cornerstone in the treatment of psychotic disorders. In practice, it is anticipated that patients with SMI initiated on LAIAs under court-order will have improved outcomes post-discharge; however, little information is available about this subgroup. Our primary objective is to determine whether court-ordered involuntary administration of LAIAs impact relapse rates, time to psychiatric readmission, and length of stay when compared to voluntary administration of LAIAs during psychiatric hospitalization.

Methods:

This multi-center, retrospective chart review includes adult patients admitted to an inpatient acute psychiatric unit between January 2016 and March 2023 who received an LAIA or oral antipsychotic (OAP) and have a diagnosis of schizophrenia, schizoaffective disorder, or bipolar I disorder. Power analysis dictated a sample size of 370 patients to detect a 5% difference in incidence of relapse and readmission. Descriptive statistics and regression models will be performed to determine patient factors associated with LAIA use and relapse. The primary outcome is rate of relapse following psychiatric hospitalization in patients discharged after inpatient initiated or reinitiated LAIA voluntarily versus involuntarily. Secondary outcomes include time to psychiatric emergency services (PES) encounter between patients on an LAIA versus patients on an OAP alone and time to hospitalization between community injection program patients versus patients involuntarily initiated on an LAIA and not enrolled.

Results:

Results will be presented at the Ohio Pharmacy Resident Conference.

Conclusions:

Conclusions will be forthcoming based on results.

Evaluation of safety outcomes of four-factor prothrombin complex concentrate + tranexamic acid versus four-factor prothrombin complex concentrate alone in patients requiring emergent anticoagulation reversal

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Learning Objectives

1. Describe the risks of thromboembolism with four-factor prothrombin complex concentrate (4F-PCC) and tranexamic acid (TXA) based on current literature
2. Discuss the safety outcomes of utilizing both 4F-PCC and TXA

Purpose

Four-factor prothrombin complex concentrate (4F-PCC) is utilized for anticoagulation reversal of warfarin and factor Xa inhibitors for life-threatening hemorrhages. Tranexamic acid (TXA) is an anti-fibrinolytic agent used in trauma patients to reduce bleeding and subsequent mortality. No studies currently explore the safety outcomes of utilizing both 4F-PCC and TXA concomitantly in patients requiring emergent anticoagulation reversal due to a major hemorrhage.

Methods

This is an institutional review board (IRB) exempt, single-center, retrospective chart review. Electronic medical records were reviewed from January 1, 2021 to September 30, 2023 of adult patients who received 4F-PCC + TXA or 4F-PCC alone for emergent anticoagulation reversal of warfarin, apixaban, edoxaban, or rivaroxaban. Patients were excluded if they were pregnant, transferred from an outside hospital, received anticoagulation reversal for a procedure unrelated to hemorrhage, experienced a thromboembolic event in the preceding 30 days, or if the time between 4F-PCC and TXA administration was greater than 12 hours. The primary outcome measure is the occurrence of thromboembolic events. The secondary outcome measure is all-cause in-hospital mortality.

Results

A total of 110 patients were included in the study. Of the 110 patients, 74 received 4F-PCC only and 36 patients received both 4F-PCC and TXA. The occurrence of thromboembolism was significantly higher in the 4F-PCC + TXA group compared to the 4F-PCC group (16.7% vs 2.7%; $p = 0.0144$). The incidence of all-cause in-hospital mortality was similar between groups [10.8% (4F-PCC) vs 19.4% (4F-PCC + TXA); $p = 0.346$].

Conclusion

The utilization of both 4F-PCC and TXA for emergent anticoagulation reversal in patients with a major hemorrhage was associated with a significantly higher risk of thromboembolism than 4F-PCC alone. There was no difference between groups for all-cause in-hospital mortality.

Evaluation of sodium-glucose cotransporter-2 inhibitor prescribing upon hospital discharge

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UAN: 0048-0000-24-177-L01-P

Learning Objectives:

1. Summarize current guideline directed medical therapy (GDMT) for patients with heart failure with reduced ejection fraction (HFrEF)
2. Review the utility of sodium glucose cotransporter-2 inhibitors (SGLT2i) in HFrEF and highlight barriers to prescribing at discharge

Purpose:

Use of SGLT2i in patients with HFrEF has demonstrated improved clinical outcomes which include reduced heart failure hospitalizations and reduction in cardiovascular mortality. The 2022 AHA/ACC/HFSA Guideline for the Management of Heart Failure added SGLT2i as one of the four main pillars of GDMT and highlight the importance of initiation and optimization of GDMT during hospitalization. Despite this, nationally, only about one in five patients hospitalized for HFrEF receive a prescription for a SGLT2i inhibitor at discharge. The purpose of this study is to evaluate discharge prescribing rates of SGLT2i in patients with HFrEF at OhioHealth Riverside Methodist Hospital and describe key factors that may prevent patients from being discharged on a SGLT2i.

Methods:

This study is a single-center, retrospective chart review of patients discharged from OhioHealth Riverside Methodist Hospital between August 1, 2023 and October 1, 2023 with HFrEF. Patients 18 years or older with HFrEF and left ventricular ejection fraction less than or equal to 40 percent were included. Patients with a left ventricular assist device, discharged to hospice, or expired during admission were excluded.

Results:

Of the 164 patients included, 40 (24.4%) were prescribed a SGLT2i on discharge. In 28 patients (70%), SGLT2i was continued from prior home medication regimen, while 12 (30%) were newly initiated on SGLT2i. Compared to patients not discharged on a SGLT2i, patients discharged on a SGLT2i were more frequently prescribed the other three pillars of GDMT. The most commonly documented reasons for not prescribing a SGLT2i were deferral to outpatient provider and concern related to estimated glomerular filtration rate (eGFR). Additional patient characteristics identified in patients not prescribed a SGLT2i include a history of diabetic ketoacidosis (DKA), history of urinary tract infection (UTI), and acute skin and soft tissue infection (SSTI).

Conclusions:

Of the four pillars of GDMT, SGLT2i were the least likely to be prescribed. Although the prescribing rate was greater than rates previously reported in literature, several barriers were identified as contributing to lower prescribing rates. Potential opportunities to increase prescribing rates of SGLT2i in eligible patients may include more complete documentation when therapy is not prescribed, education on contraindications, and importance of prescribing GDMT upon discharge rather than deferring initiation.

Incidence and Identification of Risk Factors for Multi-Drug Resistant Organisms in Community Acquired Pneumonia

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UAN: 0048-0000-24-178-L01-P

Learning Objectives:

1. Review current guideline recommendations for the treatment of community acquired pneumonia
2. Describe the current treatment protocol for multi-drug resistant organism (MDRO) CAP
3. Apply data from findings as it pertains to antibiotic selection in community acquired pneumonia

Purpose:

Based on the 2019 ATS/IDSA community-acquired pneumonia (CAP) guidelines, initial inpatient treatment decisions for broad-spectrum antibiotic coverage should be based on locally validated risk factors. This study aims to determine the percentage of CAP caused by multiple drug resistant organisms (MDROs) at Trinity Health Oakland (THO) and identify risk factors that will guide empiric antibiotic selection for those at risk for MDRO CAP. The results of this study will assist providers in the selection of empiric antibiotics if certain risk factors are highly associated with MDROs.

Methods:

This study will be a single center, retrospective chart review. MDROs will be defined as the following pathogens: Pseudomonas aeruginosa (PSA), methicillin-resistant Staphylococcus aureus (MRSA), and extended-spectrum beta-lactamase producing gram-negative bacilli (ESBL GNB). Patients were included in the study if they had a diagnosis of CAP, admitted to inpatient stay, and had a positive respiratory culture drawn within 48 hours of admission with susceptibilities reported. Patients younger than 18 years old or diagnosed with hospital/ventilator acquired pneumonia were excluded. The primary endpoint will assess the percentage of CAP caused by MDROs. The secondary endpoint will evaluate the incidence rate of CAP caused by MDROs for each risk factor included in the analysis. Our study power and alpha will be set at 80% and 0.05 with an estimated sample size of 194 subjects to achieve adequate power. Continuous variables will be described as the mean with standard deviation or median with range or interquartile range. Categorical variables will be described as frequency distributions. Univariable analysis of risk factors by group will be assessed using Student's t-test and the chi-squared analysis. Non-parametric tests will be performed for data that are non-normally distributed. Multivariable analysis of risk factors will be done using logistic regression.

Results:

To be presented at the conference.

Conclusions:

To be presented at the conference.